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Traffic Study

Scarlett Winery P16-0428-UP
Planning Commission Hearing - October 2, 2019

TRAFFIC IMPACT REPORT

PROPOSED SCARLETT WINERY ALONG PONTI ROAD IN THE NAPA VALLEY

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I. INTRODUCTION

This report has been prepared at the request of the proposed Scarlett Winery applicant to determine whether the proposed winery will result in any significant circulation impacts to the local roadway network and the need for any mitigation measures. **Figure 1** shows the proposed winery location on the east side of Ponti Road about 1,230 feet north of Skellenger Lane.

II. SCOPE OF SERVICES

The scope of service for this traffic study was developed to provide analysis that is consistent with other recent new winery traffic studies that have been approved by the Napa County Public Works Department to determine the extent of any significant circulation impacts due to the proposed project. Evaluation was conducted for harvest Friday and Saturday PM peak traffic conditions. Historical traffic count information for major Napa County roadways indicates that there are higher volumes during this time period than during all other times of the year. Existing, year 2020 and year 2030 (Cumulative – General Plan Buildout) traffic projections were developed for Ponti Road, Skellenger Lane and Silverado Trail. In addition, operating conditions were evaluated at the Silverado Trail and Ponti Road intersections with Skellenger Lane based upon recently updated County significance criteria. The ability of Ponti Road to safely accommodate project traffic was also evaluated. Finally, sight line adequacy was determined at the project driveway intersection with Ponti Road. Significant impacts, if any, were identified and measures listed, if needed, to mitigate all impacts to a less than significant level.

III. SUMMARY OF FINDINGS

A. "WITHOUT PROJECT" OPERATING CONDITIONS

1. EXISTING VOLUMES – HARVEST 2016

Silverado Trail in the project vicinity now has higher projected September 2016 harvest two-way traffic volumes during the Friday PM peak traffic hour compared to the Saturday PM peak traffic hour (about 1,725 two-way peak hour vehicles from 3:45 to 4:45 PM on Friday versus about 1,470 two-way peak hour vehicles from 4:30 to 5:30 PM on Saturday). In contrast, Skellenger Lane near the project site would have similar volumes during both the Friday and Saturday PM peak traffic hours (about 195 vehicles per hour). Ponti Road adjacent to the project site would have higher projected September harvest two-way traffic volumes during the Friday PM peak traffic hour compared to the Saturday PM peak traffic hour (about 22 two-way peak hour vehicles from 3:45 to 4:45 PM on Friday versus 7 two-way peak hour vehicles from 5:00 to 6:00 PM on Saturday). The driveway serving the project site on Ponti Road would be expected to have only minor traffic during either the Friday and Saturday PM peak hours (0-2 vehicles per hour).

2. PLANNED & ONGOING ROADWAY IMPROVEMENTS

There are no planned and funded circulation system improvements along Silverado Trail, Skellenger Lane or Ponti Road in the project vicinity.

3. YEAR 2016 HARVEST "WITHOUT PROJECT" CIRCULATION SYSTEM OPERATION

a. Intersection Level of Service

- **Silverado Trail/Skellenger Lane** intersection – Acceptable level of service during the Saturday PM peak hour, but unacceptable operation during the Friday PM peak hour.
- **Skellenger Lane/Ponti Road** intersection – Acceptable level of service during both the Friday and Saturday PM peak hours.

b. Intersection Signal Warrant Evaluation

- **Silverado Trail/Skellenger Lane** – Both Friday and Saturday PM peak hour volumes would exceed both Caltrans rural and urban peak hour signal Warrant #3 volume criteria levels.

4. YEAR 2020 HARVEST "WITHOUT PROJECT" CIRCULATION SYSTEM OPERATION

a. Intersection Level of Service

- **Silverado Trail/Skellenger Lane** intersection – Acceptable level of service during the Saturday PM peak hour, but unacceptable operation during the Friday PM peak hour.
- **Skellenger Lane/Ponti Road** intersection – Acceptable level of service during both the Friday and Saturday PM peak hours.

b. Intersection Signal Warrant Evaluation

- **Silverado Trail/Skellenger Lane** – Both Friday and Saturday PM peak hour volumes would exceed both Caltrans rural and urban peak hour signal Warrant #3 volume criteria levels.

5. YEAR 2030 CUMULATIVE HARVEST "WITHOUT PROJECT" CIRCULATION SYSTEM OPERATION

a. Intersection Level of Service

- **Silverado Trail/Skellenger Lane** intersection – Unacceptable level of service during both the Friday and Saturday PM peak hours.
- **Skellenger Land/Ponti Road** intersection – Acceptable level of service during both the Friday and Saturday PM peak hours.

b. Intersection Signal Warrant Evaluation

- **Silverado Trail/Skellenger Lane** – Both Friday and Saturday PM peak hour volumes would exceed both Caltrans rural and urban peak hour signal Warrant #3 volume criteria levels.

B. PROJECT IMPACTS

1. PROJECT TRIP GENERATION

Project harvest trip generation expected during the peak traffic hours on the local circulation system would be as follows.

FRIDAY PM PEAK HOUR TRIPS (3:45-4:45)		SATURDAY AFTERNOON PEAK HOUR TRIPS (4:30-5:30)	
IN	**OUT**	**IN**	**OUT**
2	1	1	2

2. YEAR 2016 HARVEST + PROJECT OFF-SITE CIRCULATION IMPACTS

The proposed project would not result in any significant off-site circulation impacts to either the Ponti Road or Silverado Trail intersections with Skellenger Lane. The project would not degrade operation from acceptable to unacceptable at the Skellenger Lane/Ponti Road intersection or increase peak hour volumes on the Skellenger Lane stop sign controlled approach to Silverado Trail by 10 percent or greater at this location which would already be experiencing unacceptable "Without Project" operation. ***Less than Significant.***

3. YEAR 2020 HARVEST + PROJECT OFF-SITE CIRCULATION IMPACTS

The proposed project would not result in any significant off-site circulation impacts to either the Ponti Road or Silverado Trail intersections with Skellenger Lane. The project would not degrade operation from acceptable to unacceptable at the Skellenger Lane/Ponti Road intersection or increase peak hour volumes on the Skellenger Lane stop sign controlled approach to Silverado Trail by 10 percent or greater at this location which

would already be experiencing unacceptable "Without Project" operation. ***Less than Significant.***

4. YEAR 2030 (CUMULATIVE) HARVEST + PROJECT OFF-SITE CIRCULATION IMPACTS

The proposed project would not result in any significant off-site circulation impacts to either the Ponti Road or Silverado Trail intersections with Skellenger Lane. The project would not degrade operation from acceptable to unacceptable at the Skellenger Lane/Ponti Road intersection or increase peak hour volumes on the Skellenger Lane stop sign controlled approach to Silverado Trail by 5 percent or greater at this location which would already be experiencing unacceptable "Without Project" operation. ***Less than Significant.***

5. SIGHT LINES AT PROJECT DRIVEWAY

Sight lines at the project's driveway connection to Ponti Road will meet minimum stopping sight distance criteria based upon the Caltrans March 2014 *Highway Design Manual* if landscaping on both sides of the driveway is maintained and not allowed to obstruct driver vision. ***Potentially Significant.***

6. MARKETING EVENTS

There would be 24 marketing events/year with 10 guests (4 guest vehicles) and 3 marketing events with 100 to 200 guests (36-72 guest vehicles). Marketing events would occur between 10:00 AM and 10:00 PM. However, guest arrival and departure times would be arranged to avoid traffic on the local circulation system between 3:00 and 5:30 PM. ***Less than Significant.***

7. PONTI ROAD OPERATION

Ponti Road's 15-foot width, straight and level alignment and grass/gravel shoulders should be able to acceptably accommodate the small proposed daily increase in traffic due to the project. ***Less than Significant.***

8. MITIGATIONS

Maintain landscaping along the project's driveway connection to Ponti Road at low heights to preclude sight lines being blocked for exiting drivers.

C. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to either the Ponti Road or Silverado Trail intersections with Skellenger Lane. In addition, sight lines at the project driveway connection to Ponti Road are acceptable and meet Caltrans stopping sight distance criteria assuming that the hedges along both sides of the project driveway near Ponti Road are maintained at low levels.

IV. PROJECT LOCATION & DESCRIPTION

The proposed Scarlett Winery will be located on the east side of Ponti Road about 1,230 feet north of Skellenger Lane (see **Figure 2**). The project description for the traffic analysis is as follows:

- Production of 30,000 gallons/year.
- 6 full-time and 5 part-time employees during harvest.
- 10% of grapes required will be grown off site. Grapes will be transported to the site in about 1 truck per day over 22 days.
- There will be a reduction of about 16 outhaul grape trucks per year.
- Maximum 15 tours and tasting visitors per day (by appointment only) – 7 days per week from 10:00 AM to 6:00 PM.
- Marketing events –
  - 24/year, maximum 10 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), any day.
  - 1/year, maximum 100 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.
  - 1/year, maximum 200 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.
  - 1/year, maximum 125 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.

V. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

The following locations have been evaluated.

1. **Silverado Trail/Skellenger Lane intersection (The Skellenger Lane eastbound approach is stop sign controlled.)**

2. **Skellenger Lane/Ponti Road intersection (The Ponti Road southbound approach is stop sign controlled.)**

3. **Ponti Road/Project Driveway intersection**

4. **Ponti Road roadway segment between Skellenger Lane and the project entrance**

Figure 2 presents a schematic of approach lane geometrics and control at each analysis intersection.

B. ROADWAYS

Roadway descriptions are based upon the designation that Silverado Trail and Ponti Road run in a general north-south direction through the project area and Skellenger Lane runs in an east-west direction. The project site is along the east side of Ponti Road about 1,230 feet north of Skellenger Lane.

Silverado Trail in the project vicinity has two well-paved 12-foot travel lanes and paved shoulders that are signed and striped as Class II bicycle lanes. The roadway is not controlled on its approaches to Skellenger Lane, although a left turn lane is provided on the northbound Silverado Trail intersection approach. The posted speed limit is 55 miles per.

Skellenger Lane is a two-lane rural collector roadway extending westerly from Silverado Trail. Its eastbound approach to Silverado Trail is stop sign controlled. There is centerline striping, but no posted speed limit. There are narrow paved shoulders, but no left turn lane is provided on the eastbound approach to the Ponti Road intersection. There is a deep drainage ditch along the north side of the road most of the distance between Silverado Trail and Ponti Road.

Ponti Road is a level and straight two-lane local roadway extending north of Skellenger Lane. It is 15 feet wide at the project entrance, lacks centerline striping or paved shoulders, but has wide dirt and grass shoulders. There is no posted speed limit. It is stop sign controlled on its approach to Skellenger Lane.

C. VOLUMES

1. ANALYSIS SEASONS AND DAYS OF THE WEEK

Project traffic impacts have been evaluated during harvest conditions. Based upon more than four years of historical information from Caltrans PeMS (Performance Measurement System) count surveys along SR 29 in the Napa Valley, September has the highest daily volumes of the year (during harvest), with August having the highest summer non-harvest daily volumes of the year. Since August counts were almost as high as September counts, only harvest conditions were selected for evaluation.

In regards to the peak traffic days of the week, the Napa County Travel Behavioral Study[1] shows that the highest weekday volumes in Napa Valley occur on a Friday, with the highest weekend volumes occurring on a Saturday. In addition, historical count data from the City of Napa show that Friday has the highest volumes of any weekday, while Caltrans historical counts for SR 29 between St. Helena and Napa also show that weekday AM and PM peak hour volumes are higher on a Friday than on either a Wednesday or Thursday. Therefore, Friday and Saturday peak traffic conditions were evaluated in this study.

[1] Fehr & Peers, December 8, 2014.

2. COUNT RESULTS

Friday 3:00 to 6:00 PM as well as Saturday 1:00 to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) in May 2016 at the Silverado Trail/Skellenger Lane, Skellenger Lane/Ponti Road and Ponti Road/proposed project driveway intersections. The peak traffic hours for the system were determined to be 3:45 to 4:45 PM on Friday and 4:30 to 5:30 PM on Saturday. Resultant May 2016 peak hour counts are presented in **Appendix Figure 1**. Overall, two-way May 2016 volumes along Silverado Trail just south of Skellenger Lane were highest during the May Friday PM peak traffic hour (about 1,660 vehicles on Friday versus about 1,390 vehicles during the Saturday PM peak hour). Volumes along Skellenger Lane were similar during the Friday and Saturday PM peak hours (about 180 versus 185 vehicles), while volumes along Ponti Road at the Scarlett Winery entrance were highest during the Friday PM peak traffic hour compared to the Saturday PM peak hour (22 vehicles versus 7 vehicles).

3. SEASONAL ADJUSTMENTS

May 2016 peak hour traffic counts were seasonally adjusted to reflect September 2016 harvest conditions. Historical 2015 & 2016 Friday and Saturday peak period traffic count data from Caltrans PeMS system were utilized to determine that September Friday PM peak hour volumes are about 4 percent higher than May Friday PM peak hour volumes, while September Saturday PM peak hour volumes are about 6 percent higher than May Saturday PM peak hour volumes.

Resultant harvest 2016 Friday AM and PM and Saturday PM peak hour harvest volumes are presented in **Figure 3**.

D. INTERSECTION LEVEL OF SERVICE

1. ANALYSIS METHODOLOGY

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay reported for the stop sign controlled approaches or turn movements, although overall delay is also typically reported for intersections along state highways. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. It should be noted that the 2010 analysis software for unsignalized intersections does not report overall intersection delay. However, the year 2000 software does report overall delay and was utilized to report overall intersection operation. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

2. MINIMUM ACCEPTABLE OPERATION

Napa County recently adopted new minimum acceptable operating condition standards for unsignalized intersections. Based upon the new standards, Level of Service D (LOS D) is the poorest acceptable operation for side street stop sign controlled approaches at two-way stop intersections and for all-way-stop intersections.

E. SIGNAL WARRANT EVALUATION

1. ANALYSIS METHODOLOGY

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 10 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *California Manual on Uniform Traffic Control Devices, 2014, Revision 2 (2014 CMUTCD Rev. 2)*. Section 4C of the 2014 CMUTCD Rev. 2 provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the 2014 CMUTCD Rev. 2, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a logarithmic curve and takes only the hour with the highest volume of the day into account. For intersections in rural locations (with local area population less than 10,000 people or where the posted speed limit or 85th percentile speed on the uncontrolled intersection approaches is greater than 40 miles per hour) a 70 percent warrant is applied. The regular and 70 percent warrants are typically referred to as the urban and rural peak hour warrants. Please see the **Appendix** for the warrant charts.

It should be noted that a "rural" warrant chart is utilized when the uncontrolled intersection approaches have vehicle speeds greater than 40 miles per hour or when the intersection is in a community with less than 10,000 population. The rural chart has been utilized for primary evaluation of the Silverado Trail intersection with Skellenger Lane since the speeds on Silverado Trail are greater than 40 miles per hour and it is in a rural setting, although urban warrant analysis results are also presented if exceeded.

F. PLANNED IMPROVEMENTS

There are no planned and funded improvements at any location evaluated in this study.[2]

VI. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for harvest existing (2016), year 2020 and cumulative year 2030 horizons at County request. The 2030 cumulative horizon reflects the County General Plan Buildout year. Traffic modeling for the General Plan shows the following growths in two-way weekday traffic between 2016 and 2030 for the following roadway.

Route	2016 to 2030 Projected Growth in Weekday Traffic
Silverado Trail just south of Skellenger Lane	PM peak hour = 28%

Projecting straight line traffic growth for analysis purposes, this translates into the following growth in two-way traffic between 2016 and 2020 for the same roadway segment.

Route	2016 to 2020 Projected Growth in Weekday Traffic
Silverado Trail just south of Skellenger Lane	PM peak hour = 8%

Ponti Road and Skellenger Lane are not contained in the County traffic model. Therefore, PM peak hour traffic growth from 2016 to 2030 along Skellenger Lane was projected to be about 39

[2] Mr. Rick Marshall, Napa County Public Works Department, January 2017.

percent, or the same as that along Conn Creek Road (SR 128) intersecting Silverado Trail. Both SR 128 and Skellenger Lane provide access to SR 29 via Rutherford Road. PM peak hour growth along Ponti Lane was projected at about 1% per year between 2016 and 2030.

Since traffic modeling projections were only available for weekday peak hour conditions and not for the Saturday PM peak hour, Saturday two-way PM peak hour volumes were increased by the percentages found for the Friday PM peak hour.

Resultant year 2020 harvest "Without Project" Friday and Saturday PM peak hour volumes are presented in **Figure 4**, while year 2030 harvest "Without Project" Friday and Saturday PM peak hour volumes are presented in **Figure 5**.

VII. OFF-SITE CIRCULATION SYSTEM OPERATION – WITHOUT PROJECT

1. EXISTING (2016) HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

A. INTERSECTION LEVEL OF SERVICE – see Table 3

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Unacceptable Skellenger Lane stop sign controlled approach: LOS F

b) Saturday PM Peak Hour

Acceptable Skellenger Lane stop sign controlled eastbound approach: LOS C

2. SKELLENGER LANE/PONTI ROAD

a) Friday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS A

b) Saturday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS A

B. SIGNAL WARRANT EVALUATION – see Table 4

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

b) Saturday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

2. YEAR 2020 HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

A. INTERSECTION LEVEL OF SERVICE – Table 3

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Unacceptable Skellenger Lane stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Acceptable Skellenger Lane stop sign controlled eastbound approach: LOS D

2. SKELLENGER LANE/PONTI ROAD

a) Friday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS A

b) Saturday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS A

B. SIGNAL WARRANT EVALUATION – see Table 4

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

b) Saturday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

3. CUMULATIVE (YEAR 2030) HARVEST (WITHOUT PROJECT) CONDITIONS

A. INTERSECTION LEVEL OF SERVICE – see Table 3

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Unacceptable Skellenger Lane stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Skellenger Lane stop sign controlled eastbound approach: LOS F

2. SKELLENGER LANE/PONTI ROAD

a) Friday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS B

b) Saturday PM Peak Hour

Acceptable Ponti Road stop sign controlled southbound approach: LOS A

B. SIGNAL WARRANT EVALUATION – see Table 4

1. SILVERADO TRAIL/SKELLENGER LANE

a) Friday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

b) Saturday PM Peak Hour

Volumes exceed both Caltrans rural and urban peak hour signal warrant criteria.

VIII. PROJECT IMPACT EVALUATION SIGNIFICANCE CRITERIA

A. SIGNIFICANCE CRITERIA

The following criteria were developed for recent traffic impact analyses in the County. These same criteria have been utilized in this study to determine the significance of impacts due to the project. An impact is considered to be significant if any of the following conditions are met.

1. COUNTY OF NAPA

The following criteria have recently been developed for traffic impact analyses in Napa County.

EXISTING + PROJECT CONDITIONS

A. ARTERIAL SEGMENTS

A project would cause a significant impact requiring mitigation if:

1. An arterial segment operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
2. An arterial segment operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total segment volume by one percent or more.

For the second criteria, the following equation should be used if the arterial operates at LOS E or F without the project:

$$\textit{Project Contribution \%} = \textit{Project Trips} \div \textit{Existing Volumes}$$

B. SIGNALIZED INTERSECTIONS

A project would cause a significant impact requiring mitigation if:

1. A signalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
2. A signalized intersection operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total entering volume by one percent or more.

For the second criteria, the following equation should be used if the signalized intersection operates at LOS E or F without the project:

Project Contribution % = Project Trips ÷ Existing Volumes

Maintaining LOS D or better at all signalized intersections would sometimes require expanding the physical footprint of an intersection. In some locations around the County, expanding physical transportation infrastructure could be in direct conflict with the County's goals of preserving the area's rural character, improving safety, and sustaining the agricultural industry, making these potential improvements infeasible. The County's Circulation Element lists intersections that are slated for improvement or expansion in unincorporated Napa County.[3]

Transportation studies should individually consider the feasibility of potential mitigation measures with respect to right-of-way acquisition, regardless of the intersection's place in the Circulation Element's identified improvement lists, and present potential alternative mitigation measures that do not require right-of-way acquisition. County staff would then review that information and make the decision about the feasibility of the identified potential mitigations.

For intersections that cannot be improved without substantial additional right-of-way according to both the Circulation Element and the individual transportation impact study, and where other mitigations such as updating signal timing, signal phasing and operations, and/or signing and striping improvements do not improve the LOS, LOS E or F will be considered acceptable and the one percent threshold would not apply. Analysis of signalized intersection LOS should still be presented for informational purposes, and there should still be an evaluation of effects on safety and local access, per Policy CIR-18.

[3] According to the Circulation Element dated June 8, 2008, the following intersections can be altered or expanded as a mitigation measure: SR-12/Airport Boulevard/SR-29, SR-221/SR-12/Highway 29, and several intersections along SR-29 and SR-128 north of Napa. The significance criteria shown above should apply to facilities where appropriate based upon the most recent Circulation Element chapter of the General Plan.

C. UNSIGNALIZED INTERSECTIONS (ALL WAY STOP AND SIDE STREET STOP SIGN CONTROLLED)

LOS for all way stop controlled intersections is defined as an average of the delay at all approaches. LOS for side street stop controlled intersections is defined by the delay and LOS for the worst case approach. The recommended interpretation of Policy CIR-16 regarding unsignalized intersection significance criteria is as follows:

1. An unsignalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, the LOS deteriorates to LOS E or F with the addition of project traffic, and the peak hour traffic signal warrant criteria should also be evaluated and presented for information purposes, or
2. An unsignalized intersection operates at LOS E or F during the selected peak hours without project trips and the project contributes one percent or more of the total entering traffic for all way stop controlled intersections, or 10 percent or more of the traffic on a side street approach for side street stop controlled intersections; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes.

All Way Stop Controlled Intersections

For the second criteria at an all way stop controlled intersection, the following equation should be used if the all way stop controlled intersection operates at LOS E or F without the project.

Project Contribution % = Project Trips ÷ Existing Volumes

Side Street Stop Controlled Intersections

For the second criteria at a side street stop controlled intersection, the following equation should be used if the side street stop controlled intersection operates at LOS E or F without the project.

Project Contribution % = Project Trips ÷ Existing Volumes

Both of those volumes are for the stop controlled approaches only. Each stop controlled approach that operates at LOS E or F should be analyzed individually.

CUMULATIVE+ PROJECT CONDITIONS

A. ARTERIAL SEGMENTS, SIGNALIZED INTERSECTIONS AND UNSIGNALIZED INTERSECTIONS

A project would cause a significant cumulative impact requiring mitigation if:

1. The overall amount of expected traffic growth causes conditions to deteriorate such that any of the significance criteria described above for existing conditions are met, and

2. The project's contribution to a significant cumulative impact would be equal to or greater than five percent of the growth in traffic from existing conditions.

A project's contribution to a cumulative condition would be calculated as the project's percentage contribution to the total growth in traffic from existing conditions.

Project Contribution % = Project Trips ÷ (Cumulative Volumes - Existing Volumes)

- If projected daily volumes on the project driveway in combination with volumes on the roadway providing access to the project driveway meet County warrant criteria for provision of a left turn lane on the approach to the project entrance.

- If sight lines at project access driveways do not meet Caltrans stopping sight distance criteria based upon prevailing vehicle speeds.

B. PROJECT TRIP GENERATION

Friday PM peak hour and Saturday afternoon peak hour harvest trip generation projections were developed with the assistance of the project applicant and their representative for all components of new employee, grape delivery and visitor activities associated with the proposed Scarlett Winery (see worksheets in the **Appendix**). Results are presented on an hourly basis in **Tables 5** and **6** for harvest Friday and Saturday conditions, respectively, while a summary of peak hour trips is presented in **Table 7**. During the harvest Friday PM peak traffic hour there would be a projected 2 inbound and 1 outbound vehicles, while during the harvest Saturday afternoon peak traffic hour there would be a projected 1 inbound and 2 outbound vehicles. As shown, all vehicles during the ambient Friday and Saturday peak traffic hours would be due to visitors.

C. PROJECT TRIP DISTRIBUTION

Project traffic was distributed to Skellenger Lane and Silverado Trail in a pattern reflective of existing distribution patterns. Most visitor traffic during both PM peak hours would be expected to travel to/from Silverado Trail, with the majority traveling to or from the south on Silverado Trail.

The harvest Friday and Saturday project traffic increments expected on the local roadway network during times of ambient peak traffic flows are presented in **Figure 6**. Friday and Saturday Existing "With Project" PM peak hour harvest volumes are presented in **Figure 7**; "With Project" PM peak hour harvest volumes for year 2020 conditions are presented in **Figure 8**, and "With Project" PM peak hour harvest volumes for 2030 cumulative conditions are presented in **Figure 9**.

D. PROJECT OFF-SITE IMPACTS

1. EXISTING (2016) HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic would not result in any significant level of service or signal warrant impacts at the Skellenger Lane intersections with Silverado Trail or Ponti Road during either the Friday or Saturday PM peak traffic hours. ***Less than significant.***

b. INTERSECTION LEVEL OF SERVICE IMPACTS – see Table 3

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an unacceptable LOS F with the addition of project traffic. However, the project would not increase volumes on the stop sign controlled approach by 10 percent or greater (0.6%). ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an acceptable LOS C with the addition of project traffic. ***Less than significant.***

- **SKELLENGER LANE/PONTI ROAD**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS A with the addition of project traffic. ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS A with the addition of project traffic. ***Less than significant.***

c. SIGNAL WARRANT IMPACTS – see Table 4

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    The addition of project traffic would increase volumes less than 1 percent(0.2%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

- Saturday PM Peak Hour
  The addition of project traffic would increase volumes less than 1 percent (0.1%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

2. YEAR 2020 HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic would not result in any significant level of service or signal warrant impacts at the Skellenger Lane intersections with Silverado Trail or Ponti Road during either the Friday or Saturday PM peak traffic hours. ***Less than significant.***

b. INTERSECTION LEVEL OF SERVICE IMPACTS – see Table 3

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an unacceptable LOS F with the addition of project traffic. The project would not increase volumes on the stop sign controlled approach by 10 percent or greater (0.5%). ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an acceptable LOS D with the addition of project traffic. ***Less than significant.***

- **SKELLENGER LANE/PONTI ROAD**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS A with the addition of project traffic. ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS A with the addition of project traffic. ***Less than significant.***

c. SIGNAL WARRANT IMPACTS – see Table 4

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    The addition of project traffic would increase volumes less than 1 percent (0.2%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

- Saturday PM Peak Hour
  The addition of project traffic would increase volumes less than 1 percent (0.1%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

3. CUMULATIVE (YEAR 2030) HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic would not result in any significant level of service or signal warrant impacts at the Skellenger Lane intersections with Silverado Trail or Ponti Road during either the Friday or Saturday PM peak traffic hours. ***Less than significant.***

b. INTERSECTION LEVEL OF SERVICE IMPACTS – see Table 3

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an unacceptable LOS F with the addition of project traffic. For the Cumulative scenario, the addition of project traffic to the growth in volumes from Existing to 2030 Cumulative conditions would not increase volumes on the stop sign controlled Skellenger Lane approach by 5 percent or greater (1.6%). ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Skellenger Lane intersection approach would remain an unacceptable LOS F with the addition of project traffic. However, the project would not increase the growth in traffic from Existing to 2030 Cumulative conditions on the stop sign controlled Skellenger Lane approach by 5 percent or greater (3.1%). ***Less than significant.***

- **SKELLENGER LANE/PONTI ROAD**
  - Friday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS B with the addition of project traffic. ***Less than significant.***

  - Saturday PM Peak Hour
    Operation of the stop sign controlled Ponti Road intersection approach would remain an acceptable LOS A with the addition of project traffic. ***Less than significant.***

c. SIGNAL WARRANT IMPACTS – see Table 4

- **SILVERADO TRAIL/SKELLENGER LANE**
  - Friday PM Peak Hour
    The addition of project traffic would increase the growth in traffic from Existing to Cumulative conditions less than 1 percent (+ 0.6%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

  - Saturday PM Peak Hour
    The addition of project traffic would increase the growth in traffic from Existing to Cumulative conditions less than 1 percent (0.7%) at this intersection which would already have volumes exceeding both urban and rural peak hour signal warrant criteria. ***Less than significant.***

E. SIGHT LINES AT PROJECT ENTRANCE

Sight lines at the project driveway intersection with Ponti Road are currently acceptable to the north and south along Ponti Road (at more than 900 feet in each direction). While there is no posted speed limit on Ponti Road at the project entrance, vehicles were observed traveling between 25 and 35 miles per hour during two field surveys by Crane Transportation Group.

The Caltrans Highway Design Manual (March 2014) states that stopping sight distance is the corner sight distance criteria to be utilized at private road connections to public roadways. The minimum required stopping sight distances based upon the observed vehicle speeds are as follows.

SPEED	MINIMUM REQUIRED STOPPING SIGHT DISTANCE
25 mph	150 feet
30 mph	200 feet
35 mph	250 feet

Based upon the 35 mile per hour criteria, the 900+ foot sight lines to the north and south along Ponti Road from the project driveway would be acceptable. It should be noted, however, that if landscaping on either side of the project driveway is not maintained, sight lines for exiting drivers could be reduced to less than acceptable distances. ***Potentially significant***.

F. LEFT TURN LANE AT PROJECT ENTRANCE

No County left turn lane warrant criteria were evaluated for Ponti Road at the project entrance due to the minimal volumes on the road. Also, since Ponti Road pavement ends to the north of the project, all inbound movements would be coming from the south and would be right turns into the site. ***Less than significant.***

G. PONTI ROAD OPERATION

The 1,230-foot distance of Ponti Road between the project site driveway and Skellenger Road is level, straight and 15 feet wide. It has grass and gravel shoulders, no centerline stripe and no posted speed limit. There are acceptable sight lines to/from all driveways along this segment of roadway.

Since the proposed winery would only result in 1 to 4 new trips per hour along Ponti Road (not including marketing events), the roadway should maintain acceptable operation. Traffic from the 24 marketing events/year with 10 guests (in about 4 vehicles) should also be accommodated without any significant operational or safety issues. The 3 major marketing events every year (with 100 to 200 guests) will have from 36 to 72 guest vehicles on a weekend afternoon or evening. This number of vehicles could also be accommodated as the entry and exit times would spread out over at least an hour for each event. ***Less than significant.***

H. MARKETING EVENTS

Twenty-seven marketing events per year are proposed. Detailed descriptions are presented in **Table 8**.

- Marketing events –
  - 24/year, maximum 10 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), any day.
  - 1/year, maximum 100 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.
  - 1/year, maximum 200 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.
  - 1/year, maximum 125 people (10:00 AM-6:00 PM or 6:00 PM-10:00 PM), weekend only.

Scarlett Winery is requesting that all events be held between 10:00 AM and 6:00 PM, or from 6:00 PM to 10:00 PM. However, guest arrival and departure times would be arranged to avoid traffic on the local circulation system between 3:00 and 5:30 PM ***Less than significant.***

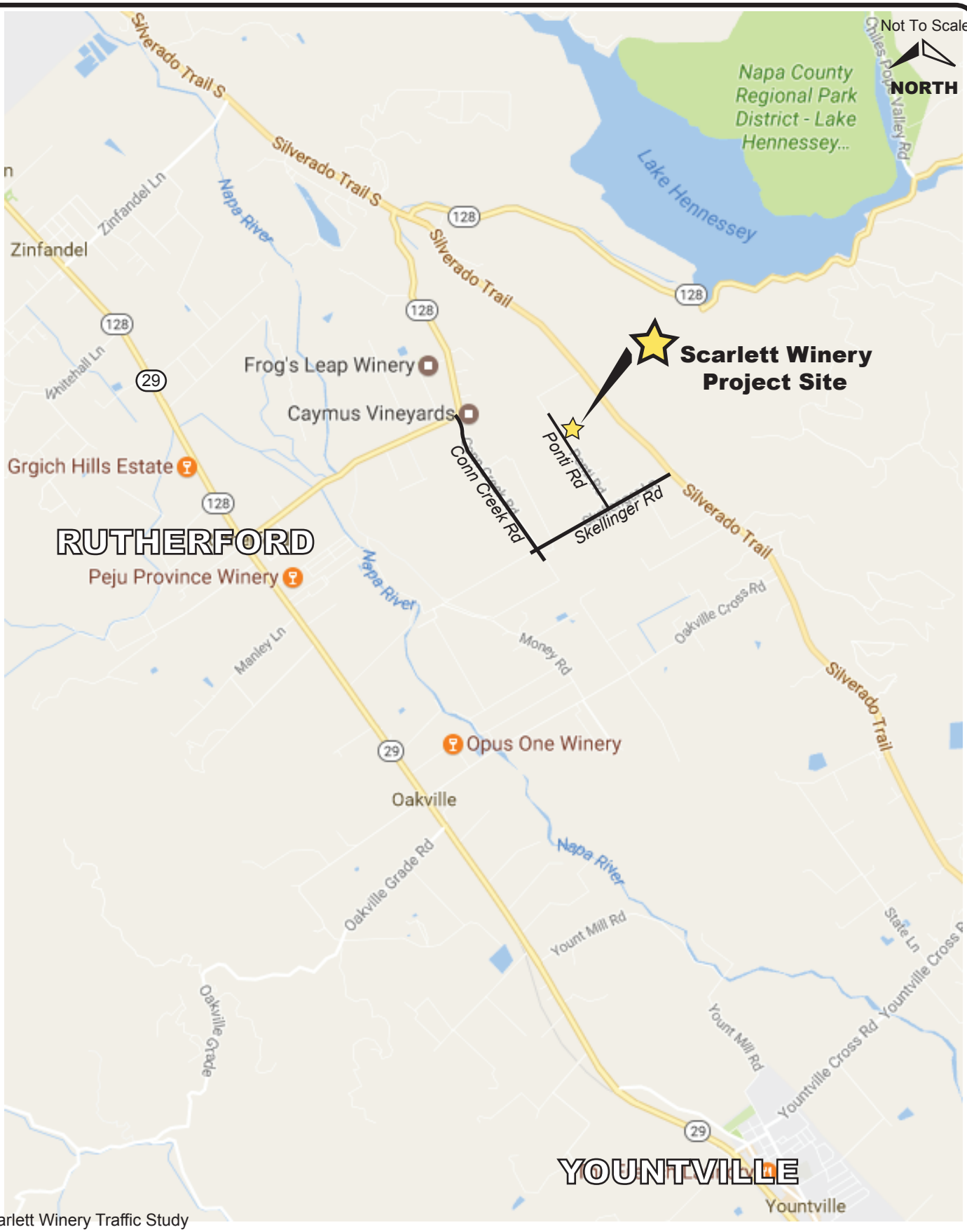
I. MITIGATIONS

Maintain landscaping along the project's driveway connection to Ponti Road at low heights to preclude sight lines being blocked for exiting drivers.

J. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to either the Ponti Road or Silverado Trail intersections with Skellenger Lane. In addition, sight lines at the project driveway connection to Ponti Road are acceptable and meet Caltrans stopping sight distance criteria assuming that the hedges along both sides of the project driveway near Ponti Road are maintained at low levels.

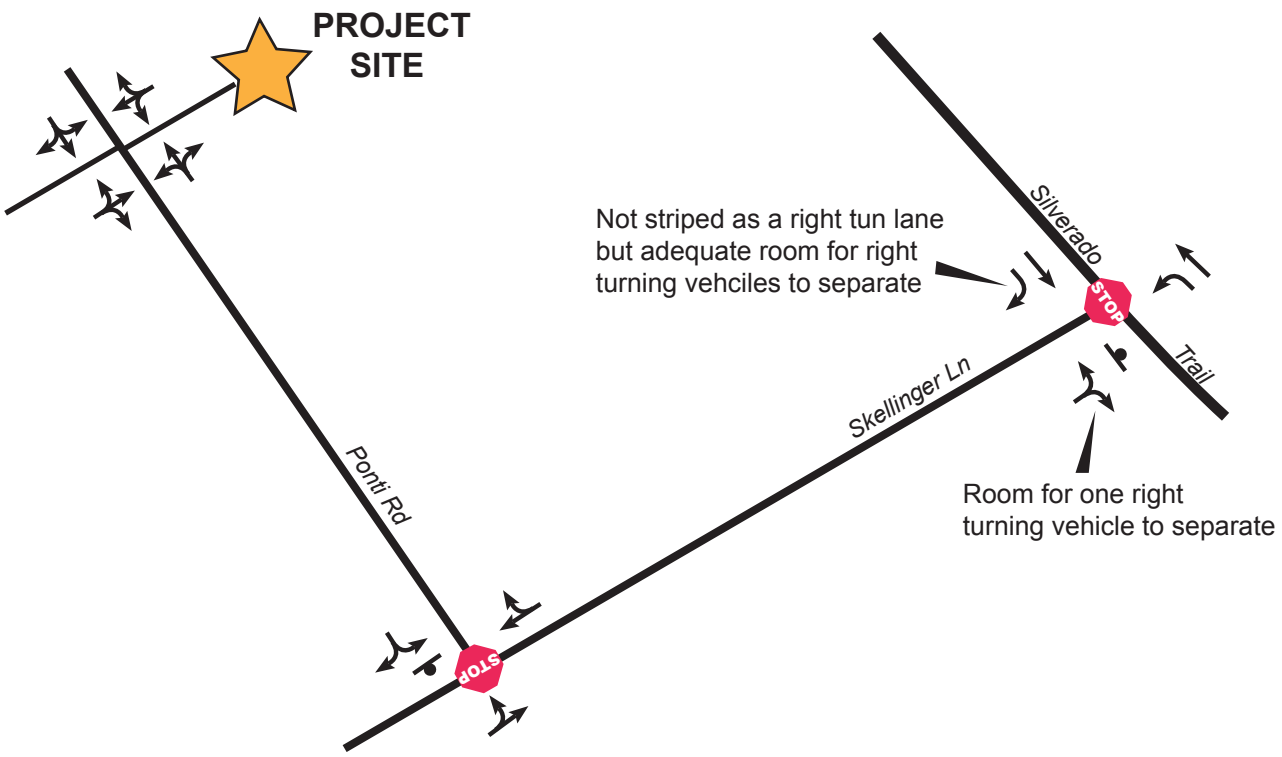
Figures



Scarlett Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 1
Area Map

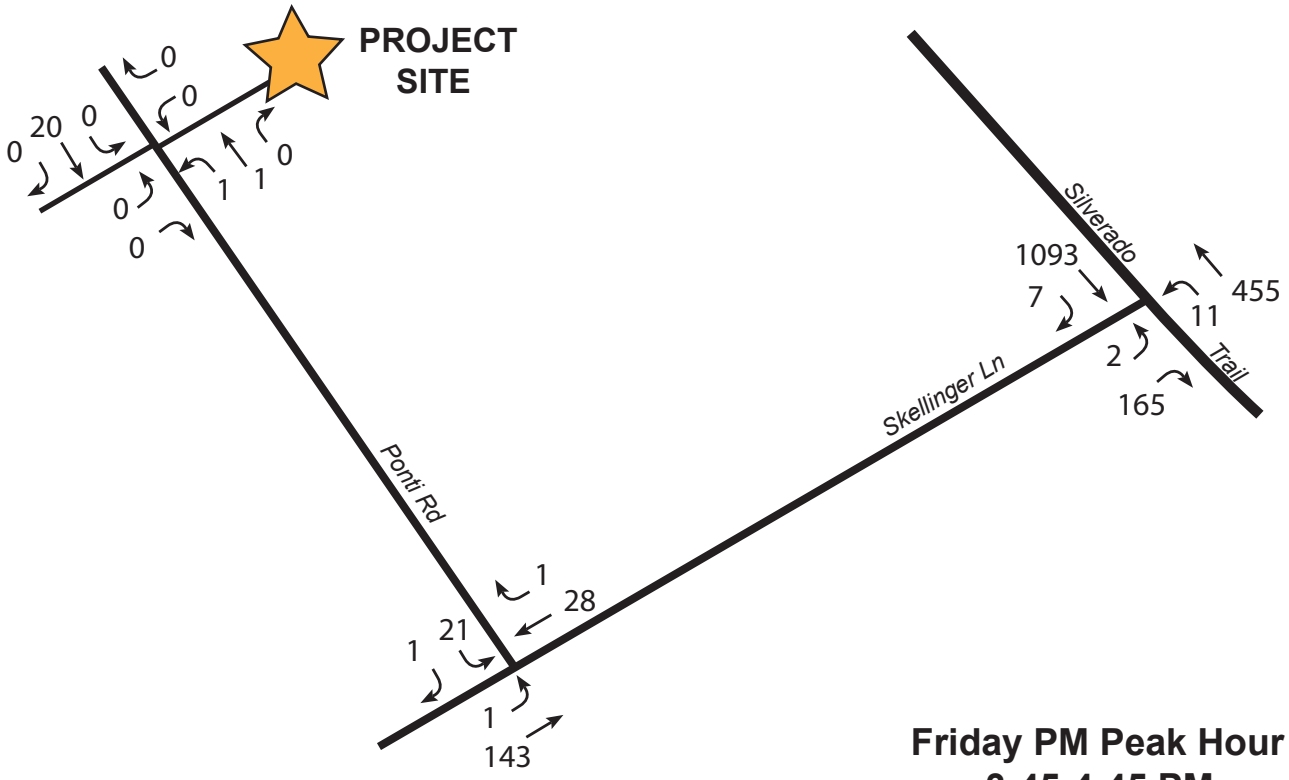


Scarlett Winery Traffic Study

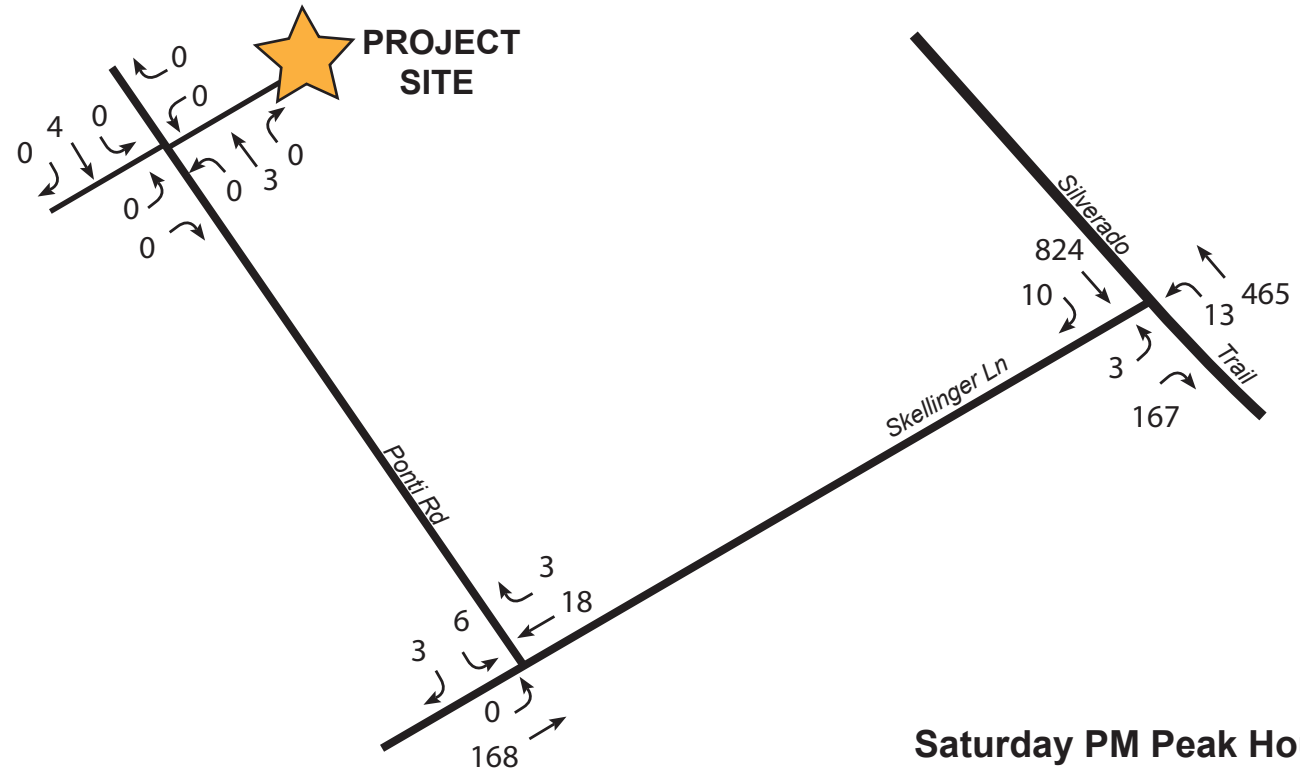
Figure 2

Lane Geometrics and Intersection Control

CRANE TRANSPORTATION GROUP



Friday PM Peak Hour
3:45-4:45 PM

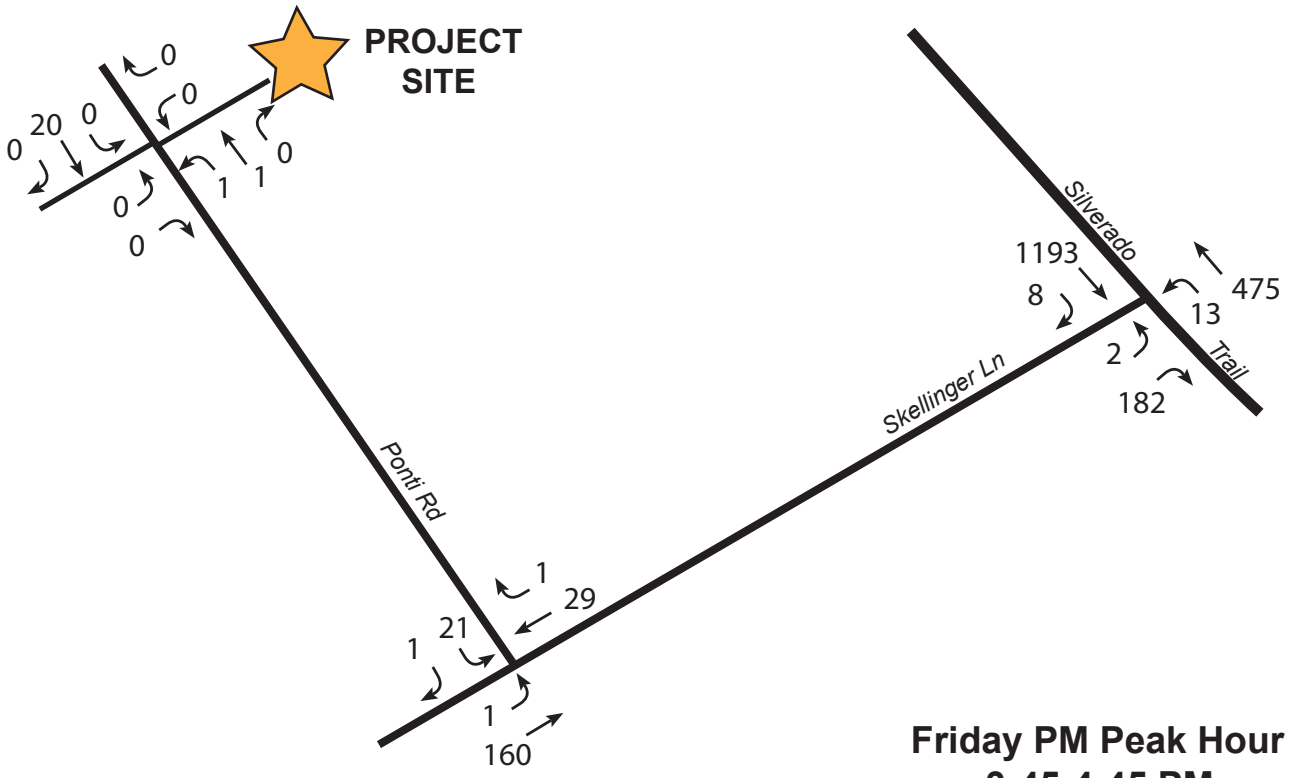


Saturday PM Peak Hour
4:30-5:30 PM

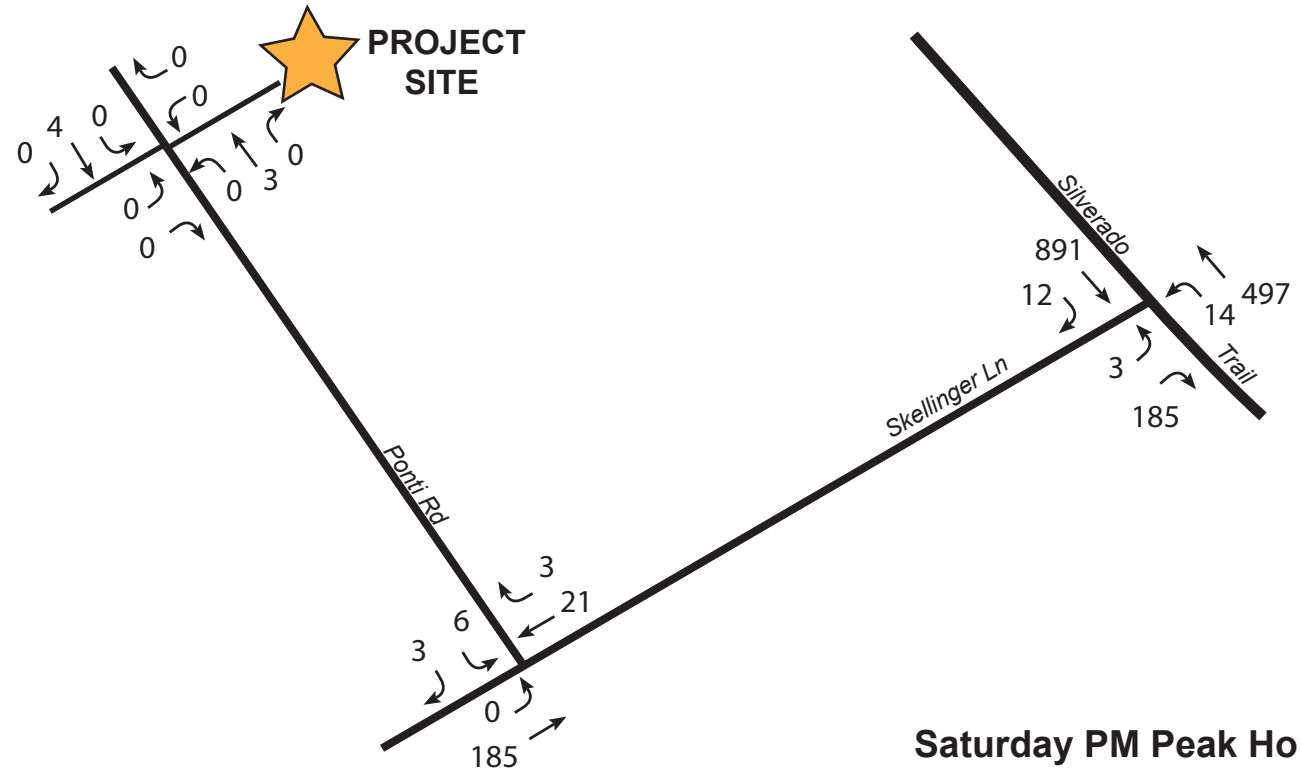
Scarlett Winery Traffic Study

Figure 3
Existing Harvest (without Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



Friday PM Peak Hour
3:45-4:45 PM

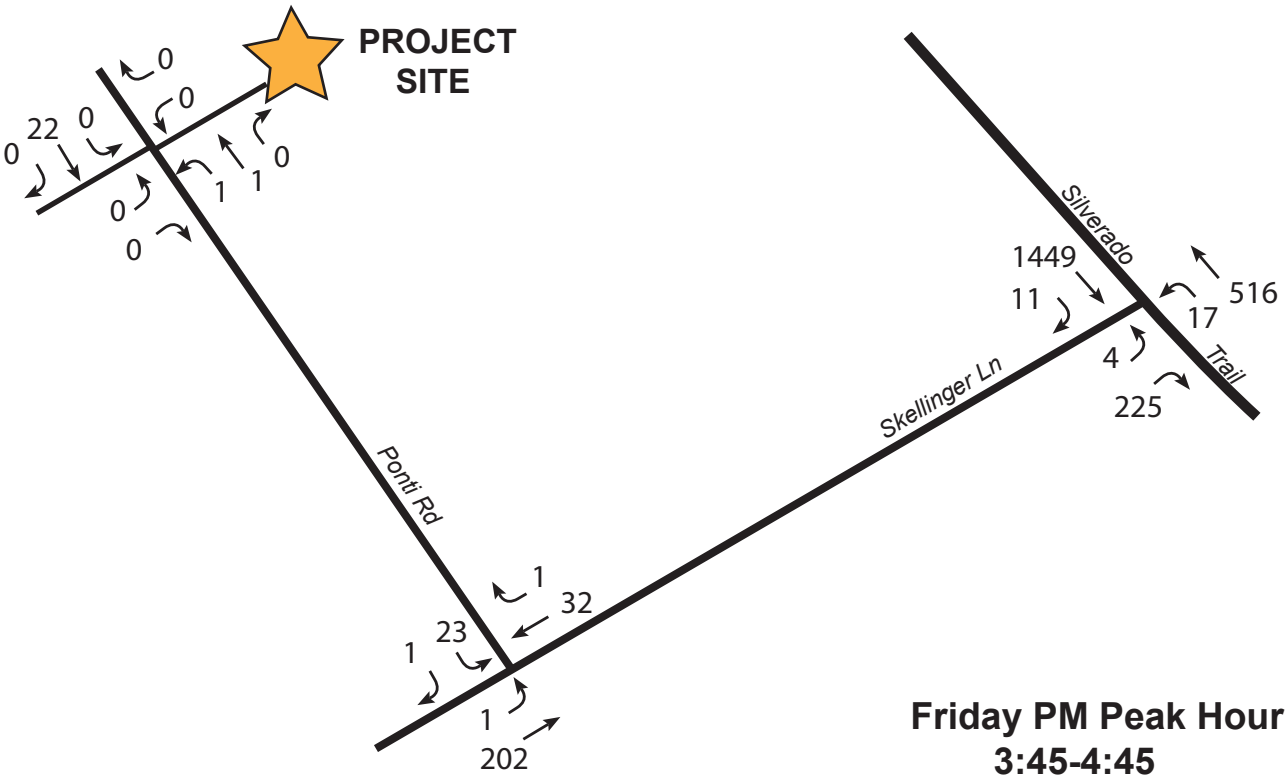


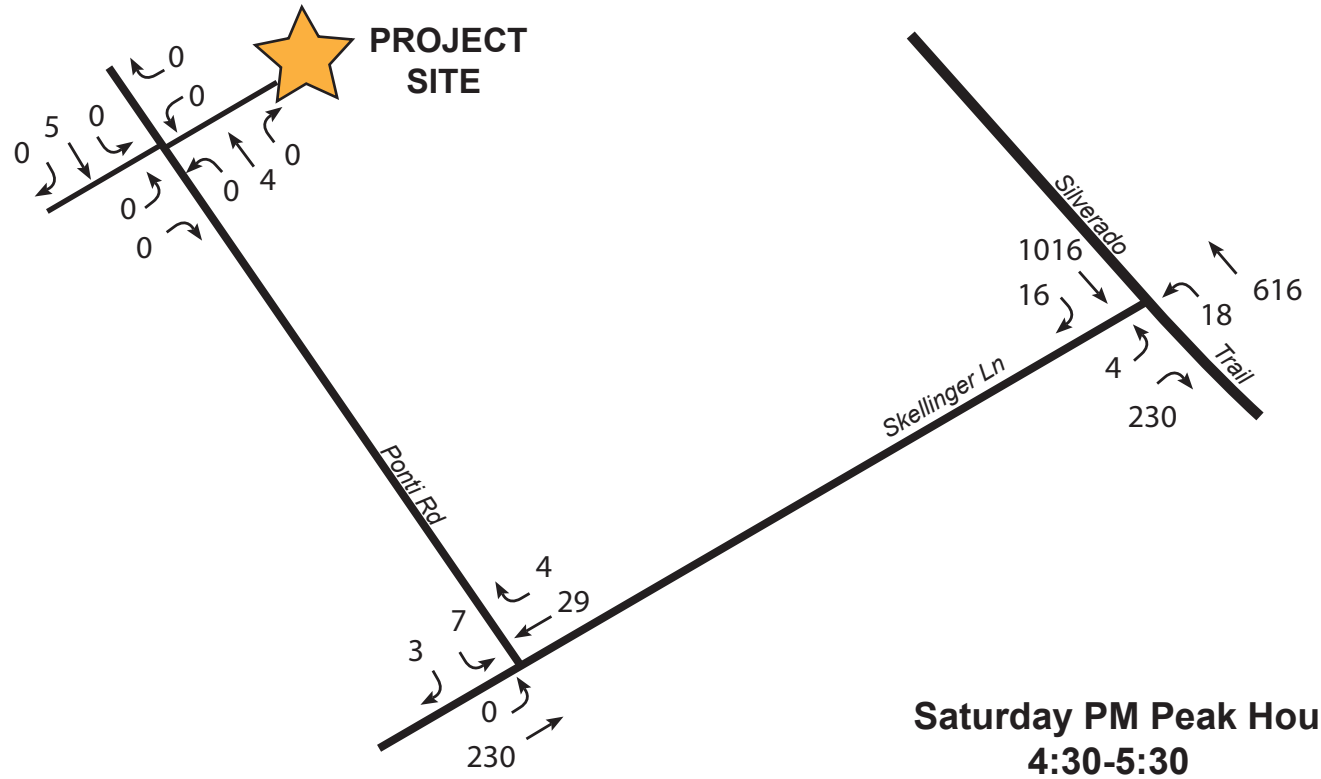
Saturday PM Peak Hour
4:30-5:30 PM

Scarlett Winery Traffic Study

Figure 4
Year 2020 Harvest (without Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



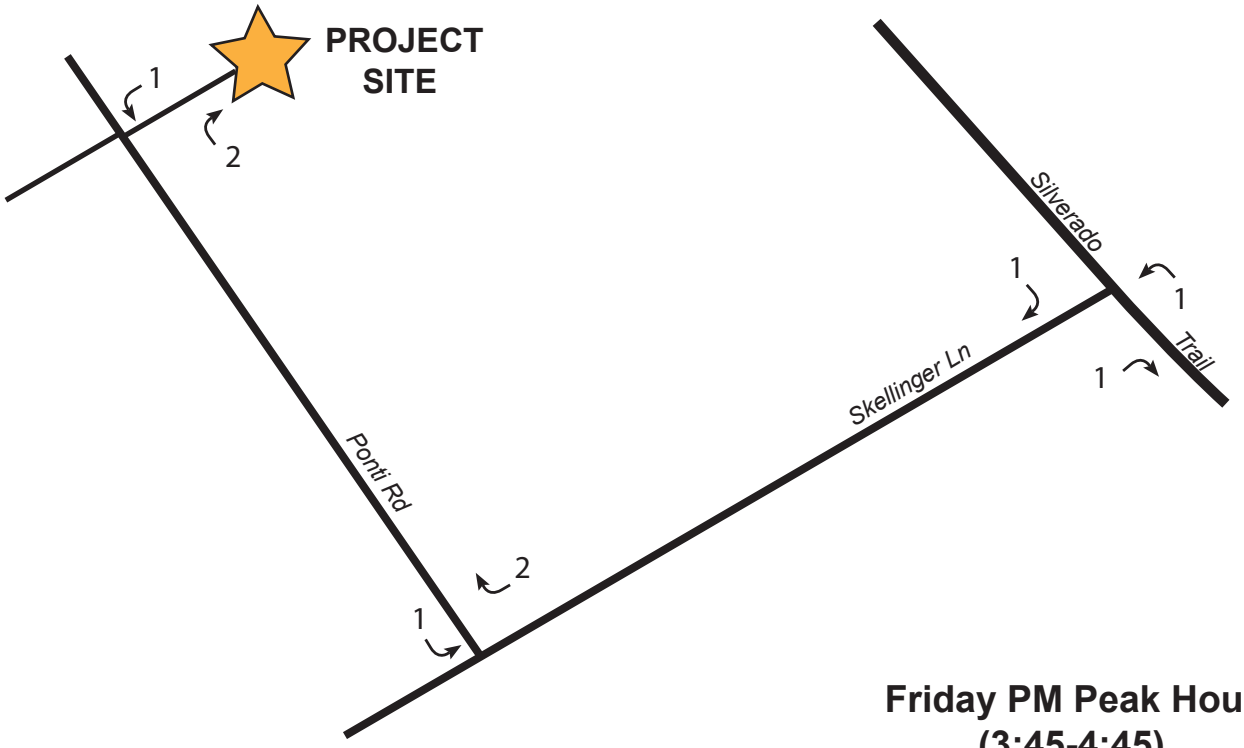


Scarlett Winery Traffic Study

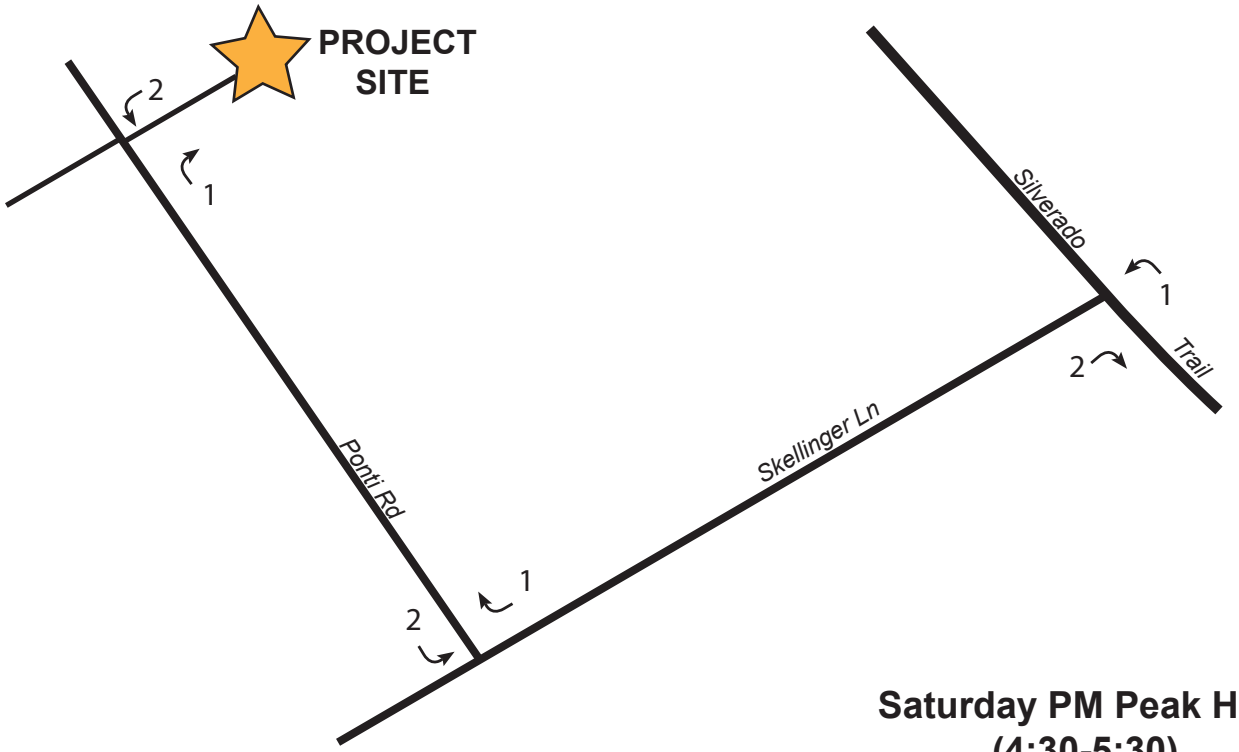
Figure 5

Year 2030 Cumulative Harvest (without Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



Friday PM Peak Hour
(3:45-4:45)



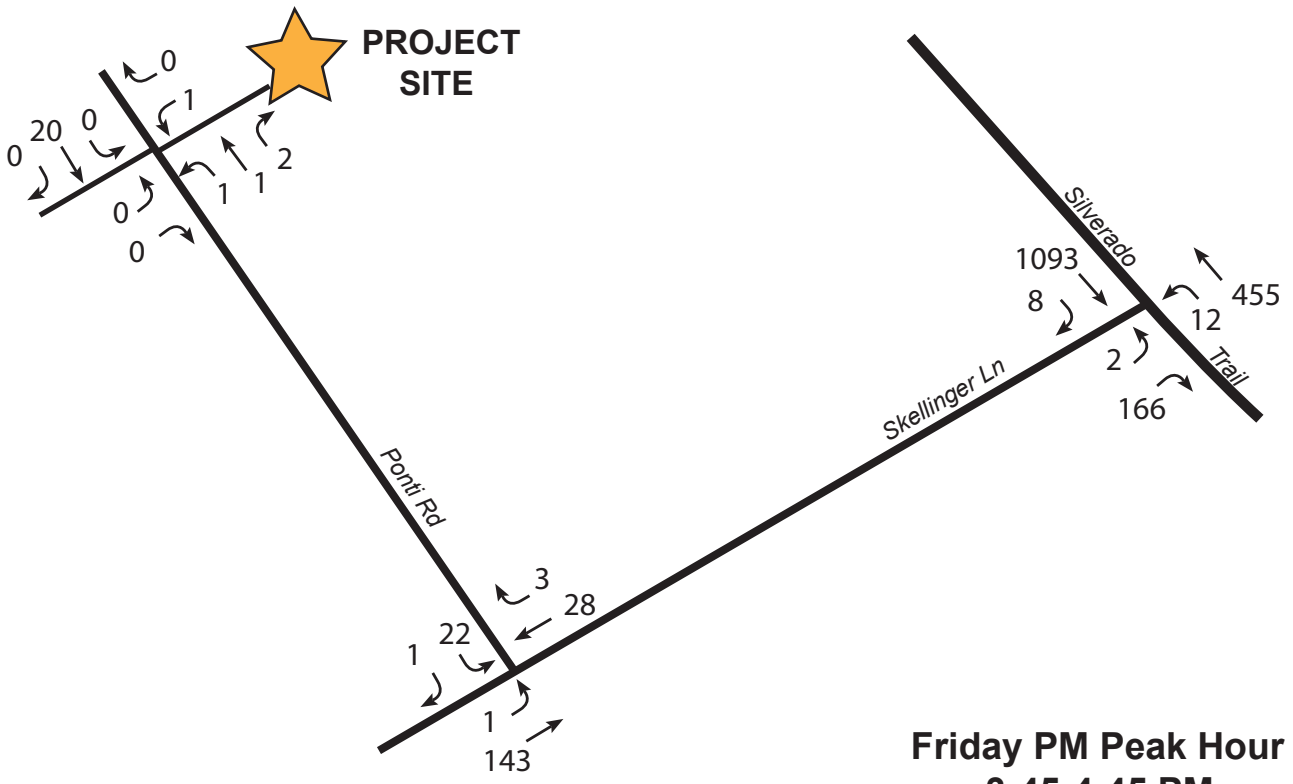
Saturday PM Peak Hour
(4:30-5:30)

Scarlett Winery Traffic Study

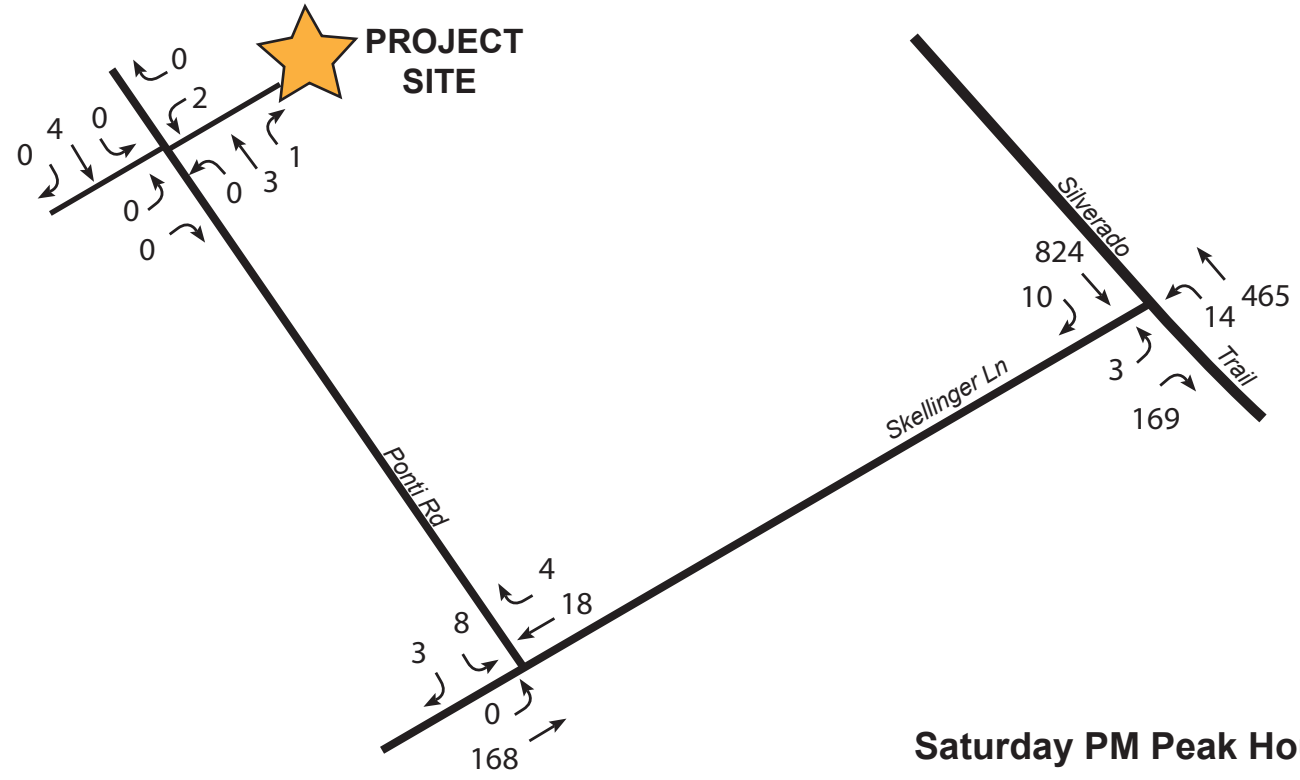
Figure 6

Friday and Saturday PM Peak Hour
Project Increment

CRANE TRANSPORTATION GROUP



Friday PM Peak Hour
3:45-4:45 PM

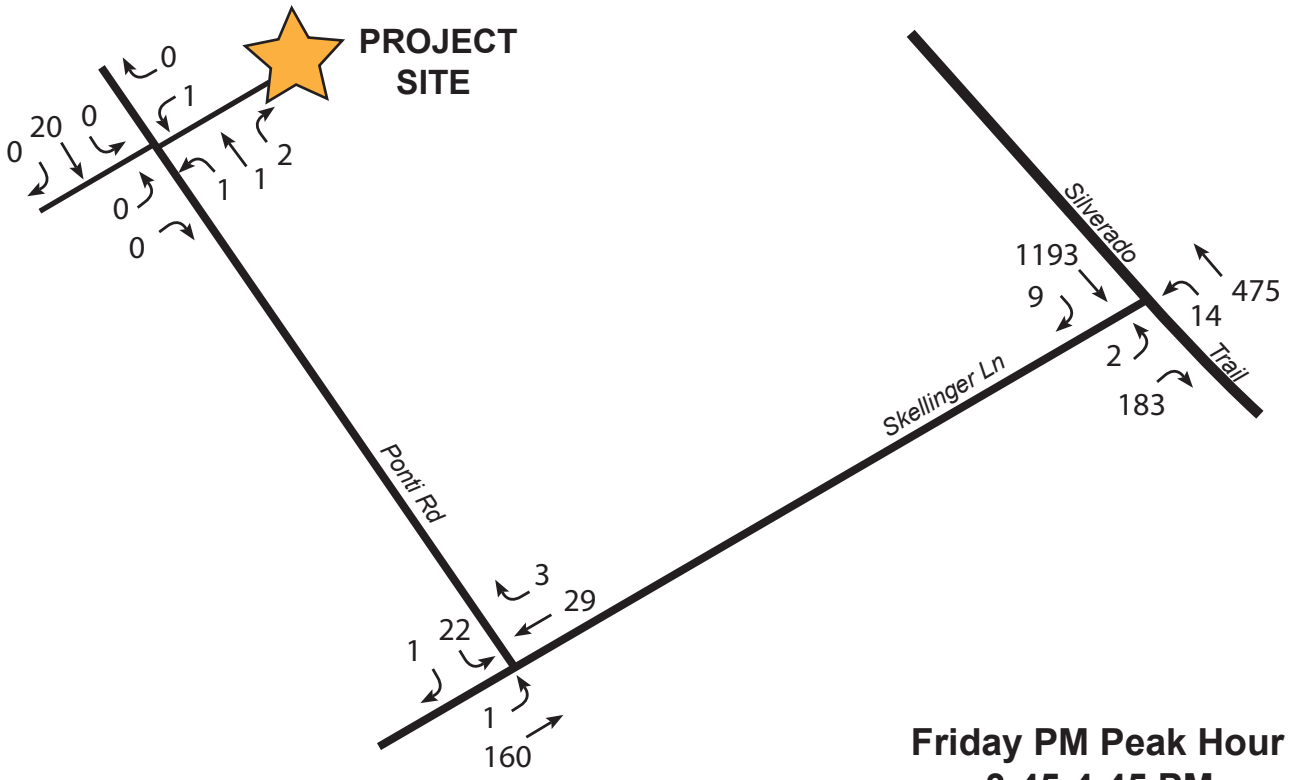


Saturday PM Peak Hour
4:30-5:30 PM

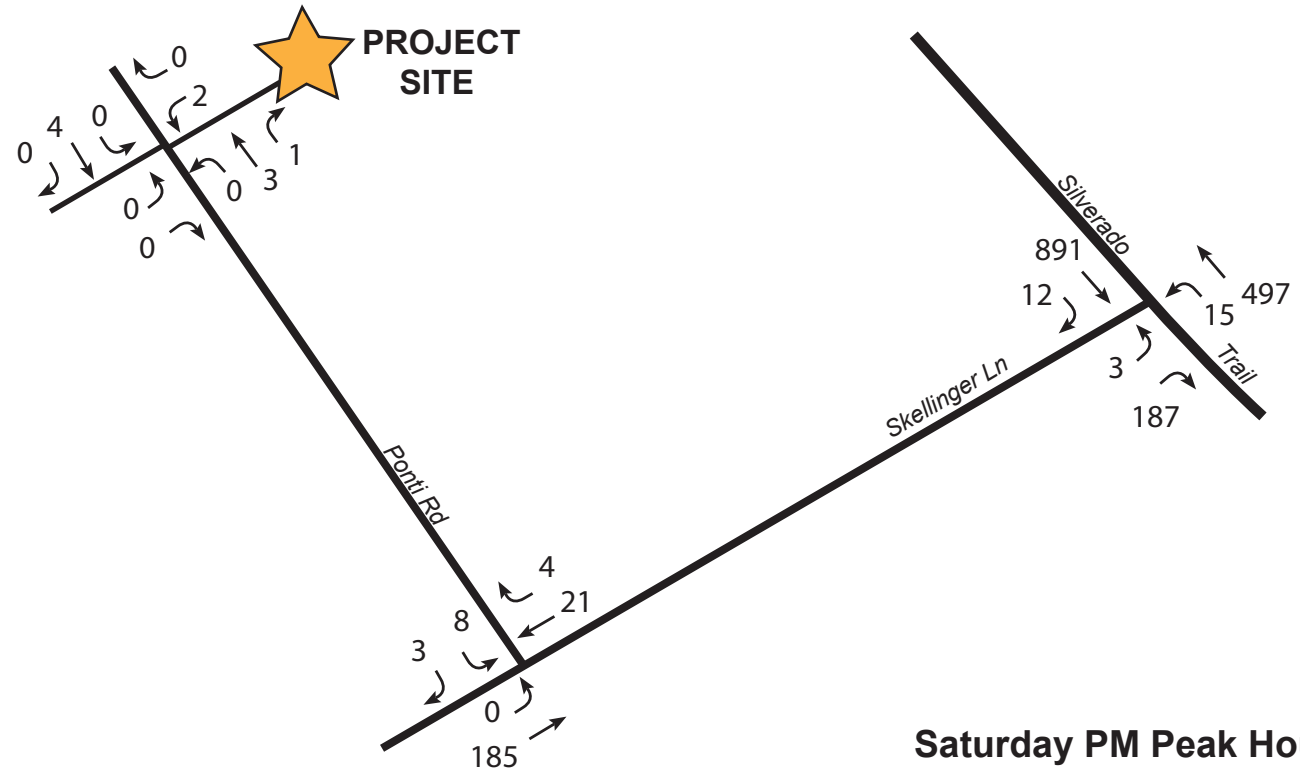
Scarlett Winery Traffic Study

Figure 7
Existing Harvest (with Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



Friday PM Peak Hour
3:45-4:45 PM

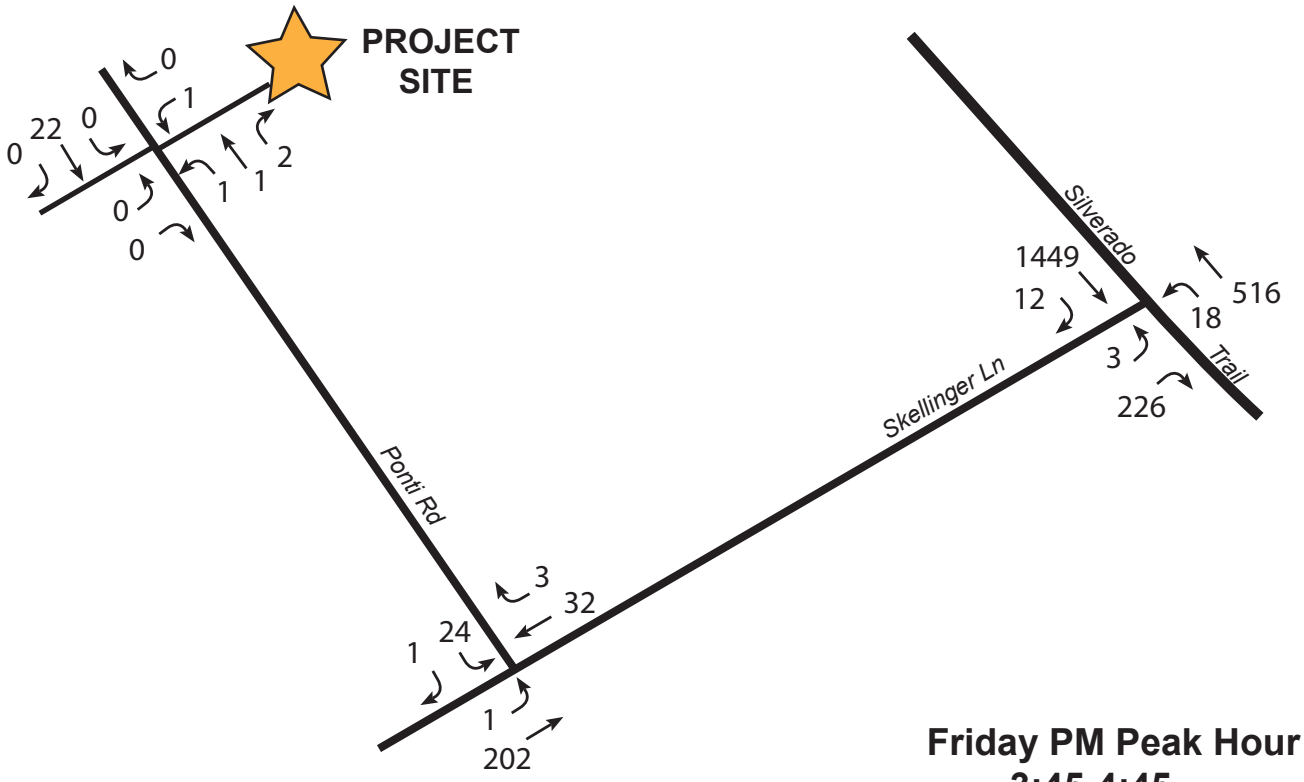


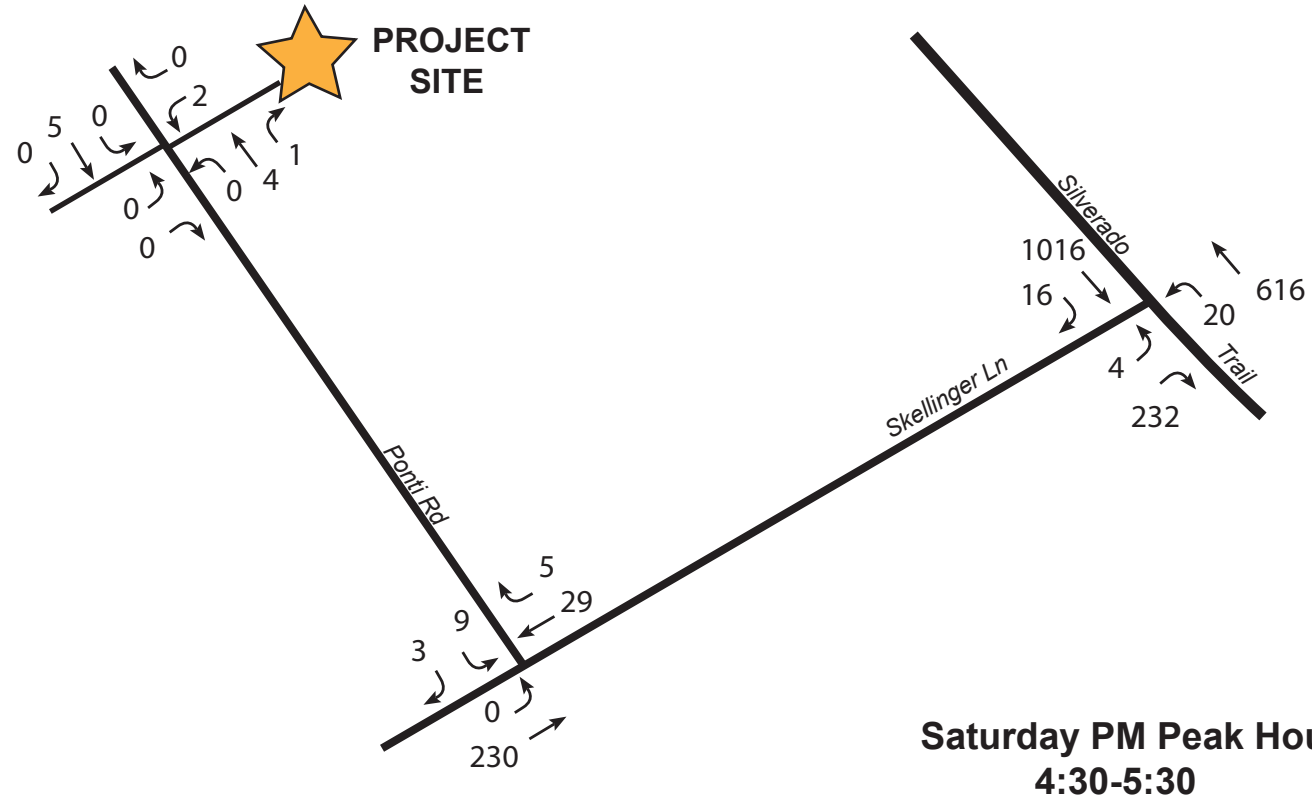
Saturday PM Peak Hour
4:30-5:30 PM

Scarlett Winery Traffic Study

Figure 8
Year 2020 Harvest (with Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP





Scarlett Winery Traffic Study

Figure 9
Year 2030 Cumulative Harvest (with Project)
Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP

Tables

Table 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.0 to 15.0
C	Average traffic delays	15.0 to 25.0
D	Long traffic delays	25.0 to 35.0
E	Very long traffic delays	35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 3

INTERSECTION LEVEL OF SERVICE

EXISTING – 2016 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (3:45-4:45)		SATURDAY PM PEAK HOUR (4:30-5:30)	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	F-50.8[(1)]	F-51.3 [0.6%]*	C-23.0	C-23.1
Skellenger Lane/ Ponti Road	A-9.8[(2)]	A-9.9	A-9.3	A-9.3

YEAR 2020 HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	F-89.3[(1)]	F-90.4 [0.5%]*	D-28.6	D-28.8
Skellenger Lane/ Ponti Road	A-9.8 [(2)]	A-9.8	A-9.3	A-9.4

CUMULATIVE YEAR 2030 HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	F-341.8[(1)]	F-344.7 [1.6%]**	F-70.7	F-71.1 [3.1%]**
Skellenger Lane/ Ponti Road	B-10.1 [(2)]	B-10.2	A-9.7	A-9.7

[(1)] Unsignalized level of service – control delay in seconds: Skellenger Lane stop sign controlled approach.
[(2)] Unsignalized level of service – control delay in seconds: Ponti Road stop sign controlled approach.

* [xx] – (Percent project traffic added to stop sign controlled intersection approach for Existing and 2020 conditions.) Less than a 10% increase for stop sign controlled approach is not considered a significant impact.
** [3%] – Percent project traffic of increased traffic growth from Existing to 2030 on stop sign controlled intersection approach. Less than a 5% increase is not considered a significant impact.

Theoretical control delay results above 120 seconds with LOS F operation are presented for "with" versus "without" project comparison purposes only. Doubtful if some drivers would wait this long to make a left turn.

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology for unsignalized intersections
Source: Crane Transportation Group

Table 4

INTERSECTION SIGNAL WARRANT EVALUATION

Do Volumes Meet Caltrans Rural Peak Hour Warrant #3 Volume Criteria Levels?

EXISTING – 2016 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (3:45-4:45)		SATURDAY PM PEAK HOUR (4:30-5:30)	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	Yes	Yes [0.2%]*	Yes	Yes [0.1%]*

YEAR 2020 HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	Yes	Yes [0.2%]*	Yes	Yes [0.1%]*

CUMULATIVE (YEAR 2030) HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Skellenger Lane	Yes	Yes [0.6%]**	Yes	Yes [0.7%]**

* [xx%] – Percent project traffic added to intersection. Less than a 1% increase for entire intersection is not considered a significant impact.

** [yy%] – Percent project traffic of increment traffic growth passing through intersection from Existing to 2030. Less than a 1% increase is not considered a significant impact.

Criteria: Caltrans Manual of Uniform Traffic Control Devices Revision 2, 2015
Source: Crane Transportation Group

Table 5

PROJECT TRIP GENERATION
SCARLETT WINERY

HARVEST

FRIDAY

NEW OR ADJUSTED ACTIVITIES	NET NEW	HOURS	TRIPS							
			3-4 PM		4-5 PM		5-6 PM		3:45-4:45 PM*	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT
Administrative Employees – Full Time	2	9:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Administrative Employees – Part Time	1	9:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Production Employees – Full Time	3	6:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Production Employees – Part Time	4	6:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Tours & Tasting Employees	1	10:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Visitors	+15 visitors/day (6 vehicles/day)[(1)]	10:00 AM-6:00 PM	2	2	1	2	0	1	2	1
Grape Delivery Trucks (total 22/year)	1/day	6:00 AM-Noon	0	0	0	0	0	0	0	0
Grape Export Trucks Eliminated (total 16/year)	1-2/day	6:00 AM-Noon	0	0	0	0	0	0	0	0
Other Trucks	1	8:00 AM-5:00 PM	0	0	0	0	0	0	0	0
TOTAL			2	2	1	2	0	1	2	1

* Peak traffic hour at Silverado Trail intersection with Skellenger Lane.
(1) 2.6 visitors/vehicle average on weekdays per County data.

Source: Scarlett Winery project applicant; Compiled by: Crane Transportation Group

Table 6

PROJECT TRIP GENERATION
SCARLETT WINERY

HARVEST

SATURDAY

NEW OR ADJUSTED ACTIVITIES	NET NEW	HOURS	TRIPS											
			1-2 PM		2-3 PM		3-4 PM		4-5 PM		5-6 PM		4:30-5:30 PM*	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Administrative Employees – Full Time	2	9:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Administrative Employees – Part Time	1	9:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Production Employees – Full Time	3	6:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Production Employees – Part Time	4	6:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Tours & Tasting Employees	1	10:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
Visitors	15 visitors/day (6 vehicles/day)[(1)]	10:00 AM-6:00 PM	1	1	2	1	2	2	1	2	0	1	1	2
Grape Delivery Trucks (total 22/year)	1	6:00 AM-Noon	0	0	0	0	0	0	0	0	0	0	0	0
Grape Export Trucks Removed (total 16/year)	1-2	6:00 AM-Noon	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL			1	1	2	1	2	2	1	2	0	1	1	2

* Peak traffic hour at Silverado Trail intersection with Skellenger Lane.
(1) 2.8 visitors/vehicle average on weekdays per County data.

Source: Scarlett Winery project applicant; Compiled by: Crane Transportation Group

Table 7

SUMMARY OF SCARLETT WINERY TRIP GENERATION

FRIDAY PM PEAK HOUR TRIPS (3:45-4:45)		SATURDAY AFTERNOON PEAK HOUR TRIPS (4:30-5:30)	
IN	**OUT**	**IN**	**OUT**
2	1	1	2

Source: Crane Transportation Group

Table 8

SCARLETT WINERY
MARKETING EVENT TRAFFIC DETAILS

MARKETING EVENT	STAFF/GUEST CATEGORY	# OF PEOPLE	# OF VEHICLES	TIMES	REGULAR VISITATION ELIMINATED DURING MARKETING EVENT?
Marketing 24 total	Guests	10	4	10:00 AM-6:00 PM or 6:00 PM-10:00 PM Thursday-Sunday	No
	Extra Winery Staff	2	2		
	Caterers	2	1		
	Entertainers	1	1		
	Delivery vehicles	2	2		
Marketing 1 total	Guests	100	36	10:00 AM-6:00 PM or 6:00 PM-10:00 PM Weekend	Yes
	Extra Winery Staff	2	2		
	Caterers	4	1		
	Entertainers	1	1		
	Delivery vehicles	2	2		
Marketing 1 total	Guests	200	72	10:00 AM-6:00 PM or 6:00 PM-10:00 PM Weekend	Yes
	Extra Winery Staff	4	4		
	Caterers	4	2		
	Entertainers	2	2		
	Delivery vehicles	2	2		
Marketing 1 total	Guests	125	45	10:00 AM-6:00 PM or 6:00 PM-10:00 PM Weekend	Yes
	Extra Winery Staff	4	4		
	Caterers	2	1		
	Entertainers	2	2		
	Delivery vehicles	2	2		

Source: Scarlett Winery applicant

Appendix

Appendix

SCARLETT WINERY
EXPECTED PROJECT TRAFFIC ACTIVITY DETAILS
HARVEST

Gallons/Year Production: 30,000

A. **Full-time admin employees** # on Weekdays _2___ # on Saturday __2__ # on Sunday __1__ Work hours: Weekday 9:00 AM to 6:00 PM Saturday 9:00 AM to 6:00 PM Sunday 9:00 AM to 6:00 PM	B. **Part-time admin employees** # on Weekdays _1___ # on Saturday __1__ # on Sunday __0__ Work hours: Weekday 9:00 AM to 6:00 PM Saturday 9:00 AM to 6:00 PM Sunday N/A
C. **Full-time production employees** # on Weekdays _3___ # on Saturday __3__ # on Sunday __1__ Work hours: Weekday 6:00 AM to 6:00 PM Saturday 6:00 AM to 6:00 PM Sunday 6:00 AM to 6:00 PM	D. **Part-time production employees** # on Weekdays _4___ # on Saturday __4__ # on Sunday __0__ Work hours: Weekday 6:00 AM to 6:00 PM Saturday 6:00 AM to 6:00 PM Sunday 6:00 AM to 6:00 PM
E. **Tours & tasting employees** # on Weekdays _1___ # on Saturday __1__ # on Sunday __1__ Work hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM	F. **Grape delivery trucks** # on Weekdays _1__ # on Saturday __1___ # on Sunday ___1__ Delivery hours: Weekday 6:00 AM to Noon Saturday 6:00 AM to Noon Sunday 6:00 AM to Noon # days of grape delivery: 22
G. **Maximum tours/tasting visitors** # on Weekdays _15__ # on Saturday __15__ # on Sunday _15__ Tasting hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM	H. **Other employees** N/A

Appendix

SCARLETT WINERY
EXPECTED PROJECT TRAFFIC ACTIVITY DETAILS

	HARVEST CONDITIONS
I.	**Other trucks on regular basis**
	# on Weekdays _1__
	# on Saturday __0___
	# on Sunday ___0__
	Delivery hours:
	Weekday 8:00 AM to 5:00 PM
	Saturday N/A
	Sunday N/A

J. **Grape Source & Truck Routes**

Percent grapes that will be grown on site: 90%
Grapes grown off-site – access route to Winery entrance
Percent grapes transported to the site from the north on Silverado Trail: 5%
Percent grapes transported to the site from the south on Silverado Trail: 5%
Number of existing grape outhaul trucks eliminated due to use of on-site grapes for proposed winery: 16

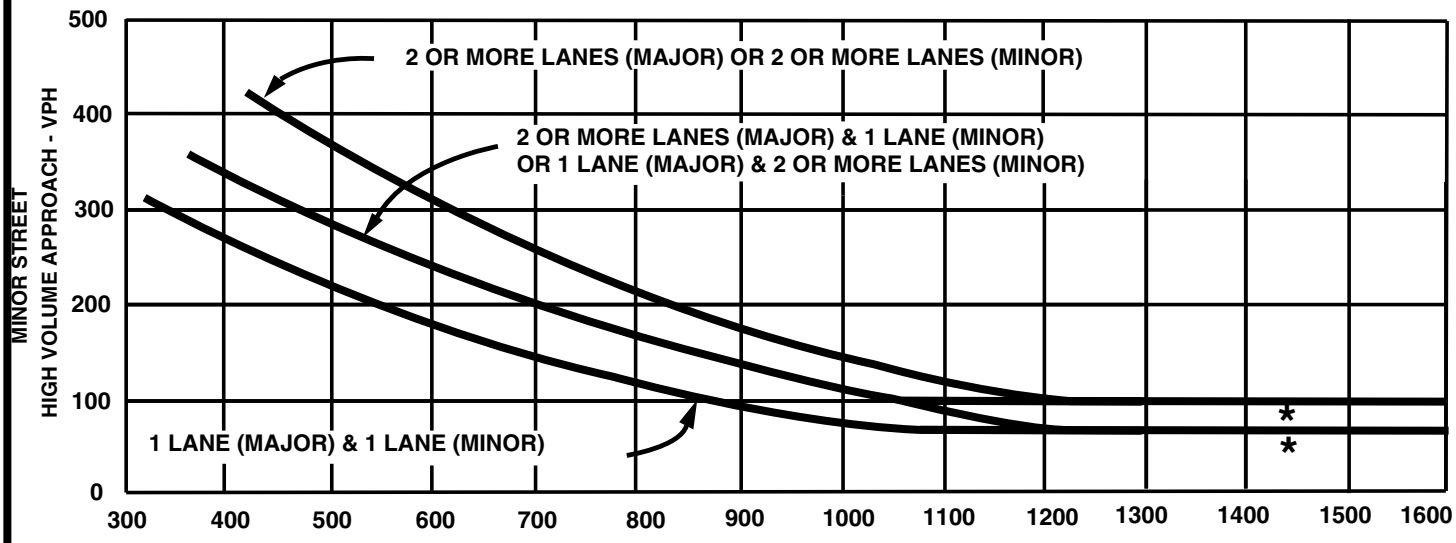
K. **Marketing Events**

Marketing Event #1	# events/year: 24 maximum # people/event: 10 typical days: Thursday-Sunday typical hours: 10:00 AM to 6:00 PM or 6:00 PM to 10:00 PM
Marketing Event #2	# events/year: 1 maximum # people/event: 100 typical days: weekend typical hours: 10:00 AM to 6:00 PM or 6:00 PM to 10:00 PM
Marketing Event #3	# events/year: 1 maximum # people/event: 200 typical days: weekend typical hours: 10:00 AM to 6:00 PM or 6:00 PM to 10:00 PM
Marketing Event #4 Auction	# events/year: 1 maximum # people/event: 125 typical days: weekend typical hours: 10:00 AM to 6:00 PM or 6:00 PM to 10:00 PM

L. **Bottling**

Days of on-site bottling per year: 12

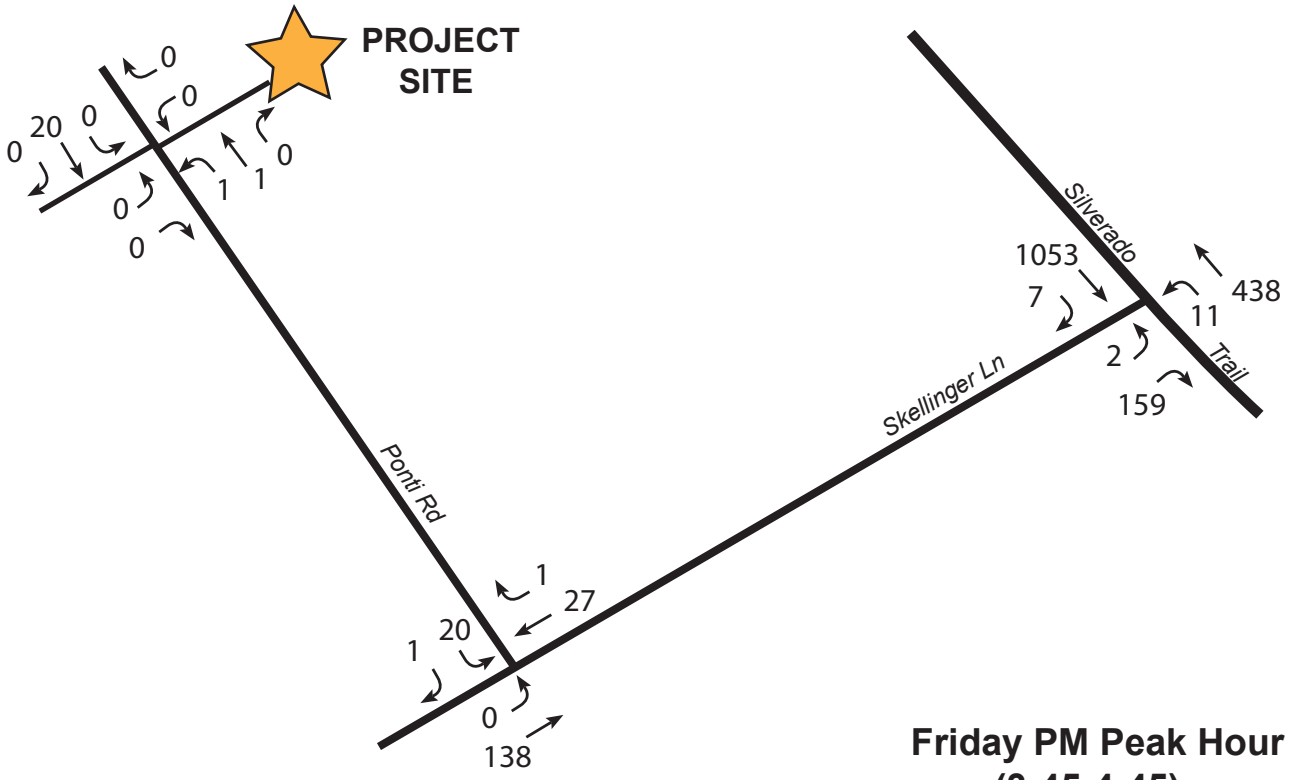
PEAK HOUR VOLUME WARRANT #3
(Rural Area)



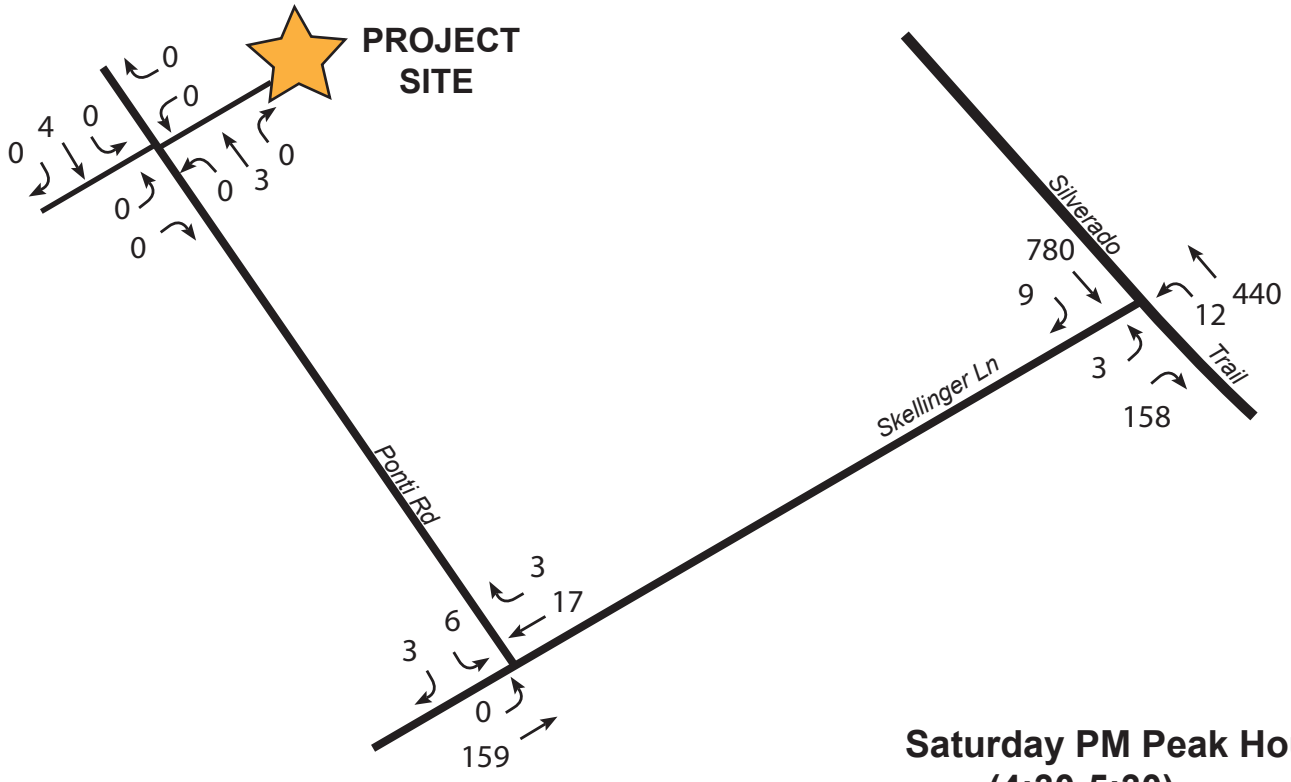
*** NOTE**

100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: California Manual on Uniform Traffic Control Devices, 2010



Friday PM Peak Hour
(3:45-4:45)



Saturday PM Peak Hour
(4:30-5:30)

Scarlett Winery Traffic Study

Figure A-1

Existing May 2016 Friday and Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP

TECHNICAL APPENDIX

Capacity Worksheets

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	159	11	438	1053	7
Future Vol, veh/h	2	159	11	438	1053	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	2	167	12	461	1108	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1592	1108	1108	0	-	0
Stage 1	1108	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.25	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	119	255	584	-	-	-
Stage 1	319	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	117	255	584	-	-	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	319	-	-	-	-	-
Stage 2	611	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.4	0.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	584	-	117	255	-	-
HCM Lane V/C Ratio	0.02	-	0.018	0.656	-	-
HCM Control Delay (s)	11.3	-	36.3	42.5	-	-
HCM Lane LOS	B	-	E	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	4.2	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	138	27	1	20	1
Future Vol, veh/h	1	138	27	1	20	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	160	31	1	23	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	33	0	-	0	195	32
Stage 1	-	-	-	-	32	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1592	-	-	-	798	1048
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	871	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1592	-	-	-	797	1048
Mov Cap-2 Maneuver	-	-	-	-	797	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	870	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	806
HCM Lane V/C Ratio	0.001	-	-	-	0.03
HCM Control Delay (s)	7.3	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	167	13	465	824	10
Future Vol, veh/h	3	167	13	465	824	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	170	13	474	841	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1342	841	841	0	-	0
Stage 1	841	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	169	368	803	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	166	368	803	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	166	368	-	-
HCM Lane V/C Ratio	0.017	-	0.018	0.463	-	-
HCM Control Delay (s)	9.6	-	27.1	22.9	-	-
HCM Lane LOS	A	-	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	2.4	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	168	18	3	6	3
Future Vol, veh/h	0	168	18	3	6	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	189	20	3	7	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	24	0	-	0	211	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1604	-	-	-	782	1061
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1604	-	-	-	782	1061
Mov Cap-2 Maneuver	-	-	-	-	782	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1604	-	-	-	857
HCM Lane V/C Ratio	-	-	-	-	0.012
HCM Control Delay (s)	0	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	182	13	475	1193	8
Future Vol, veh/h	2	182	13	475	1193	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	2	192	14	500	1256	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1783	1256	1256	0	-	0
Stage 1	1256	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.25	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	91	209	512	-	-	-
Stage 1	271	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	89	209	512	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	271	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	89.3	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	512	-	89	209	-	-
HCM Lane V/C Ratio	0.027	-	0.024	0.917	-	-
HCM Control Delay (s)	12.2	-	46.4	89.8	-	-
HCM Lane LOS	B	-	E	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	7.5	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	160	29	1	21	1
Future Vol, veh/h	1	160	29	1	21	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	186	34	1	24	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	35	0	-	0	222	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	188	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1589	-	-	-	771	1045
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1589	-	-	-	770	1045
Mov Cap-2 Maneuver	-	-	-	-	770	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1589	-	-	-	779
HCM Lane V/C Ratio	0.001	-	-	-	0.033
HCM Control Delay (s)	7.3	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	185	14	497	891	12
Future Vol, veh/h	3	185	14	497	891	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	189	14	507	909	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1445	909	909	0	-	0
Stage 1	909	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	147	336	757	-	-	-
Stage 1	396	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	144	336	757	-	-	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	396	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.6	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	757	-	144	336	-	-
HCM Lane V/C Ratio	0.019	-	0.021	0.562	-	-
HCM Control Delay (s)	9.8	-	30.5	28.6	-	-
HCM Lane LOS	A	-	D	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	3.3	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	185	21	3	6	3
Future Vol, veh/h	0	185	21	3	6	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	208	24	3	7	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	27	0	-	0	233	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1600	-	-	-	760	1057
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1600	-	-	-	760	1057
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	832	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1600	-	-	-	839
HCM Lane V/C Ratio	-	-	-	-	0.012
HCM Control Delay (s)	0	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	35.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	225	17	516	1449	11
Future Vol, veh/h	4	225	17	516	1449	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	4	234	18	538	1509	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2082	1509	1509	0	-	0
Stage 1	1509	-	-	-	-	-
Stage 2	573	-	-	-	-	-
Critical Hdwy	7.1	6.22	4.25	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	40	~ 148	407	-	-	-
Stage 1	152	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	39	~ 148	407	-	-	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	145	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 342.4	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	407	-	39	148	-	-
HCM Lane V/C Ratio	0.044	-	0.107	1.584	-	-
HCM Control Delay (s)	14.2	-	108.3	$ 346.6	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	16.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	202	32	1	23	1
Future Vol, veh/h	1	202	32	1	23	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	235	37	1	27	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	38	0	-	0	275	38
Stage 1	-	-	-	-	38	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1585	-	-	-	719	1040
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1585	-	-	-	718	1040
Mov Cap-2 Maneuver	-	-	-	-	718	-
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1585	-	-	-	727
HCM Lane V/C Ratio	0.001	-	-	-	0.038
HCM Control Delay (s)	7.3	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	230	18	616	1016	16
Future Vol, veh/h	4	230	18	616	1016	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	235	18	629	1037	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1702	1037	1037	0	-	0
Stage 1	1037	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	102	283	678	-	-	-
Stage 1	345	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	99	283	678	-	-	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	345	-	-	-	-	-
Stage 2	501	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	57.9	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	678	-	99	283	-	-
HCM Lane V/C Ratio	0.027	-	0.041	0.829	-	-
HCM Control Delay (s)	10.5	-	42.9	58.2	-	-
HCM Lane LOS	B	-	E	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	6.8	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	230	29	4	7	3
Future Vol, veh/h	0	230	29	4	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	258	33	4	8	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	37	0	-	0	293	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1587	-	-	-	702	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	702	1044
Mov Cap-2 Maneuver	-	-	-	-	702	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	779
HCM Lane V/C Ratio	-	-	-	-	0.014
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	166	12	455	1093	8
Future Vol, veh/h	2	166	12	455	1093	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	2	175	13	479	1151	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1655	1151	1151	0	-	0
Stage 1	1151	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.25	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	109	241	562	-	-	-
Stage 1	304	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	106	241	562	-	-	-
Mov Cap-2 Maneuver	106	-	-	-	-	-
Stage 1	304	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	51.3	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	562	-	106	241	-	-
HCM Lane V/C Ratio	0.022	-	0.02	0.725	-	-
HCM Control Delay (s)	11.6	-	39.6	51.4	-	-
HCM Lane LOS	B	-	E	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	5	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	143	28	3	22	1
Future Vol, veh/h	1	143	28	3	22	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	166	33	3	26	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	36	0	-	0	203	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1588	-	-	-	790	1045
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1588	-	-	-	789	1045
Mov Cap-2 Maneuver	-	-	-	-	789	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	865	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1588	-	-	-	797
HCM Lane V/C Ratio	0.001	-	-	-	0.034
HCM Control Delay (s)	7.3	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	169	14	465	824	10
Future Vol, veh/h	3	169	14	465	824	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	172	14	474	841	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1344	841	841	0	-	0
Stage 1	841	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	169	368	803	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	166	368	803	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	601	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.2	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	166	368	-	-
HCM Lane V/C Ratio	0.018	-	0.018	0.469	-	-
HCM Control Delay (s)	9.6	-	27.1	23.1	-	-
HCM Lane LOS	A	-	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	2.4	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	168	18	4	8	3
Future Vol, veh/h	0	168	18	4	8	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	189	20	4	9	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	25	0	-	0	211	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1603	-	-	-	782	1061
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1603	-	-	-	782	1061
Mov Cap-2 Maneuver	-	-	-	-	782	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1603	-	-	-	842
HCM Lane V/C Ratio	-	-	-	-	0.015
HCM Control Delay (s)	0	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	183	14	475	1193	9
Future Vol, veh/h	2	183	14	475	1193	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	2	193	15	500	1256	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1785	1256	1256	0	-	0
Stage 1	1256	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	7.1	6.22	4.25	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	64	209	512	-	-	-
Stage 1	212	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	63	209	512	-	-	-
Mov Cap-2 Maneuver	63	-	-	-	-	-
Stage 1	206	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	90.6	0.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	512	-	63	209	-	-
HCM Lane V/C Ratio	0.029	-	0.033	0.922	-	-
HCM Control Delay (s)	12.2	-	64.1	90.9	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	7.5	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	160	29	3	22	1
Future Vol, veh/h	1	160	29	3	22	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	186	34	3	26	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	37	0	-	0	223	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	188	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1587	-	-	-	770	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	769	1044
Mov Cap-2 Maneuver	-	-	-	-	769	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	778
HCM Lane V/C Ratio	0.001	-	-	-	0.034
HCM Control Delay (s)	7.3	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	187	14	497	891	12
Future Vol, veh/h	3	187	14	497	891	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	191	14	507	909	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1445	909	909	0	-	0
Stage 1	909	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	147	336	757	-	-	-
Stage 1	396	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	144	336	757	-	-	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	396	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.9	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	757	-	144	336	-	-
HCM Lane V/C Ratio	0.019	-	0.021	0.568	-	-
HCM Control Delay (s)	9.8	-	30.5	28.9	-	-
HCM Lane LOS	A	-	D	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	3.3	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	185	21	4	8	3
Future Vol, veh/h	0	185	21	4	8	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	208	24	4	9	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	28	0	-	0	234	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1599	-	-	-	759	1056
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1599	-	-	-	759	1056
Mov Cap-2 Maneuver	-	-	-	-	759	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	832	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1599	-	-	-	822
HCM Lane V/C Ratio	-	-	-	-	0.015
HCM Control Delay (s)	0	-	-	-	9.4
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	35.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	226	18	516	1449	12
Future Vol, veh/h	4	226	18	516	1449	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	15	2	2	0
Mvmt Flow	4	235	19	538	1509	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2084	1509	1509	0	-	0
Stage 1	1509	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.25	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.335	-	-	-
Pot Cap-1 Maneuver	59	~ 148	407	-	-	-
Stage 1	204	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	56	~ 148	407	-	-	-
Mov Cap-2 Maneuver	56	-	-	-	-	-
Stage 1	204	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 344.7	0.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	407	-	56	148	-	-
HCM Lane V/C Ratio	0.046	-	0.074	1.591	-	-
HCM Control Delay (s)	14.3	-	74.8	$ 349.5	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	16.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	202	32	3	24	1
Future Vol, veh/h	1	202	32	3	24	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	1	235	37	3	28	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	41	0	-	0	276	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1581	-	-	-	718	1038
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1581	-	-	-	717	1038
Mov Cap-2 Maneuver	-	-	-	-	717	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1581	-	-	-	726
HCM Lane V/C Ratio	0.001	-	-	-	0.04
HCM Control Delay (s)	7.3	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	231	18	616	1016	16
Future Vol, veh/h	4	231	18	616	1016	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	35	125	-	-	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	236	18	629	1037	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1702	1037	1037	0	-	0
Stage 1	1037	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	102	283	678	-	-	-
Stage 1	345	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	99	283	678	-	-	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	345	-	-	-	-	-
Stage 2	501	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	58.4	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	678	-	99	283	-	-
HCM Lane V/C Ratio	0.027	-	0.041	0.833	-	-
HCM Control Delay (s)	10.5	-	42.9	58.7	-	-
HCM Lane LOS	B	-	E	F	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	6.9	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	230	29	4	8	3
Future Vol, veh/h	0	230	29	4	8	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	258	33	4	9	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	37	0	-	0	293	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1587	-	-	-	702	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	702	1044
Mov Cap-2 Maneuver	-	-	-	-	702	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	771
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0